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Vol. 62 WELLINGTON, JANUARY 15, 1941. No. 1

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The New Zealand Journal of Agriculture

Published by direction of the Hon. W. LEE MARTIN, Minister of Agriculture.

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FEEDING SHEEP UNDER WAR CONDITIONS

Although written primarily for farmers in Great Britain, this article on sheep-feeding under war conditions contains so much valuable information applicable to New Zealand that it was thought well worth while to republish it in the "Journal." The article, which is by Professor J. A. Scott Watson, appeared in "Transactions of the Highland and Agricultural Society," Vol. LII, and has been adapted for New Zealand conditions by Mr. G. G. Calder, Instructor in Agriculture, Alexandra.

IT is one of the aims of our national war agricultural policy to maintain, or if possible increase, our home output of mutton and lamb. The arguments for the official view are that even in ordinary times sheep consume smaller amounts of imported feeding stuffs in proportion to the quantity of meat that they produce than any other class of livestock, and that in winter, when the demands on feeding stuffs are at their peak, the breeding flock can pick up a large part of its living from pasture.

A larger output of mutton and lamb does not necessarily imply an increased number of breeding ewes. In some cases it is possible to increase the numbers of the flock, but in many other cases numbers are already as large as they can well be. Sometimes the state of affairs that is implied by saying that land is "sheep sick" is largely due to stomach worm infestation, which can be kept under some degree of control by the use of drenches and pills; but there is no way of preventing the damage that is done to pasture by punishing it with excessive numbers of ewes in winter and early spring. Where numbers are already about a maximum, the way to increase output must be to keep the lambs to a greater age and to market them at heavier weights. In recent times there has been a steady tendency towards the earlier marketing of lambs at lighter weights.

Two Main Feeding Problems

It seems best to think separately of the two main feeding problems:—

(1) Those of the ewe in late winter and early spring, and

(2) Of the lamb in summer and early autumn.

Spring grass is the best of all food for the nursing ewe, and the earlier that this can be provided the shorter will be the period of hand feeding. Attempts to force an early bite may, of course, be foiled by weather conditions, but if careful preparations are made it may be expected that spring growth can be produced about a fortnight before the normal time.

It is well known that a supply of available nitrogen is one of the things that are required to start grass into active growth, and hence one of the essential steps in the production of early grass is to give—in, say, July or early August—a dressing of about 1 cwt. of quick-acting fertiliser, such as sulphate of ammonia, or 2 to 3 cwt. of ammoniated super per acre. But this is by no means the whole story. This nitrogen is like the whip to a horse, and unless the horse is both

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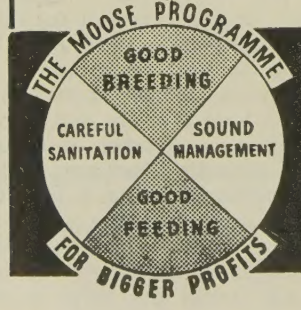
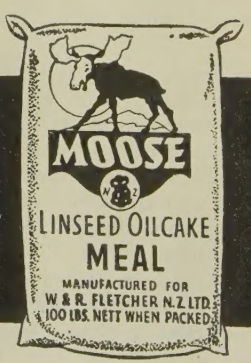


MOOSE

LINSEED OIL CAKE NUTS AND MEAL



strong and willing the response will be small. The willing horses among our pasture plants are the ryegrasses and then the cocksfoots, and the only fields that are worth treatment are those containing a good proportion of these. Obviously, too, a light and well-drained soil will warm up quickly in spring, whereas clay land is necessarily late. The fields for the purpose must also be selected with reference to elevation and exposure.

Grazing System

The next necessary step is to adopt a system of grazing in the autumn and winter that will bring the grasses into strong condition—that is, a system that will allow the plants to store a large reserve of food in their roots and leaf bases. To this end, the field after it has been grazed fairly bare in the early autumn is closed up from stock until the active growth comes to an end for the season. The bulk of the roughage should now be grazed off and the area completely spelled from June onwards. Even light stocking in the winter weakens and exhausts the ryegrass so that it cannot answer quickly to the fertiliser.

Another obvious way of reducing the ewe's demands for feeding stuff is to delay the lambing. This may be sound policy in certain cases, but it will generally be unwise to adopt the corresponding step with, say, a regular breeding flock of half-breds. The point is that the first heat of the ewe produces in a big proportion of cases a double ovulation (two eggs), whereas the later heats often give only a single egg. If the early heats are missed the proportion of twins will certainly be less.

Use of Other Foods

Until grass comes the ewes must be kept in milk by the use of other foods, and it is well known that an increased ration of turnips or swedes is no satisfactory substitute for the ordinary allowance of dry food. It is, in fact, a common observation that an abundant root crop often produces crops of big but "soft" lambs and causes trouble from shortage of milk in the ewes.

The explanation seems to be that roots are, by themselves, an ill-balanced food for the purpose of nourishing the lamb, either before or after birth. If we must make shift with more roots and less dry food, something may be done to adjust the balance by changing the composition of the latter—by putting in more of the high protein foods, such as meat-meal, linseed cake, good lucerne hay, and good red clover hay.

On some farms very good results are being obtained from grass ensilage as a food for ewes in this season. If the grass is mown some three weeks before it is ready for haying and is ensiled with molasses a very high standard product is obtained. Naturally, if only a limited amount of ensilage is provided it should be kept until close on lambing time.

Feed for Lambs

To turn to the second problem, the demand for lamb food falls at a season of the year when the needs of other classes of livestock are at their lowest, and it might be argued that the need for economy will not be so urgent. But from the broad point of view the summer should undoubtedly be used to build up a reserve supply of feeding-stuffs as an insurance against a scarcity in winter.

On farms that are not very heavily stocked with sheep, the lack of lamb food will mean that the lambs will fatten more slowly and that numbers will have to be finished after weaning. Where numbers of sheep are large and have been large for some time, there is the difficulty that lambs will not only fail to get fat in the absence of box feeding, but may fail to make thriving stores. In many cases the explanation of this fact is to be found in the level of worm infestation. The lamb that is eating half a pound of grain is somehow able to fight down the parasites, while the other lamb, dependent on milk and grass, fails to do so. Worm treatment is, in this sense, some sort of substitute for box-feeding, and should be kept in mind, but with worm treatment and grain feeding lambs will naturally thrive and fatten well.

In fattening out lambs in late summer and autumn it is important to make full use of the clean second-growths off hay and ensilage paddocks and stubbles. Of course, where feasible the value of a crop of rape for lamb fattening is well known, but if the fattening can be achieved without the rape then that land can probably be better utilised in producing grain or winter feed.

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THE Director-General's PAGE

Dairy Production.

CLIMATIC conditions over the Dominion during the early summer continued to be favourable for dairy production, although there has been a period of dry weather in the Auckland district. This has made it possible to save heavy crops of grass reserved for hay and ensilage making in the best condition.

On the other hand, good rains fell in the South Island in some areas which were beginning to show a decrease in output.

It was expected that the change-over from butter to cheese-making by such a large body of cream suppliers would have resulted in a decrease in the output of butter manufactured, but the figures actually show a substantial increase in both.

In view of the serious reduction in the Australian output as the result of the drought which prevailed in the Commonwealth until the end of November, New Zealand's increase is particularly pleasing, and it will assist in making up the shortage in the Australian exports to Great Britain.

This abnormal increase in both butter and cheese has created certain difficulties which have been accentuated as the result of war conditions interfering with supplies from overseas, and to meet the position certain modifications in the usual practices have been necessary. A lighter class of parchment is being used for lining butter boxes, and the binding has been reduced from two wires to one.

In cheese factories where sufficient shelving is not available to allow the cheese to be kept on the shelves for the regulation period of 14 days, permission has been granted for packing and forwarding it to cool stores at an earlier date. As the peak period has now been passed, this should not be necessary in the near future.

Because of the foresight of those controlling the industry the difficulties which arose during 1914-18 in obtaining supplies of rennet are not likely to be repeated. All requirements are now produced by the rennet company established at Eltham.

Although timber for butter boxes and cheese crates is also produced in the Dominion, difficulties have arisen in keeping up the supplies. Timber for the manufacture of butter boxes especially must be cut some months before it is required to allow time for seasoning. The amount of Kahikatea provided for this season's requirements has fallen far short of the demand. It was fortunate that during recent years experimental shipments of butter packed in "sap" Rimu boxes had been carried out under the direction of the Department of Agriculture, and, as the result, sufficient information was available to appear to justify the use of this timber to supplement the stocks of Kahikatea. Supplies of Rimu boxes are now being forwarded to a large number of creameries.

This change has not been made without some difficulties, and kiln drying has been necessary in order to keep up the supply of boxes to the creameries.

Here again, a modification of the regulations has been necessary. It has been found that the nails hold much better in Rimu than in Kahikatea, and that if the usual number is used in fastening the lid to the box the latter is liable to split across the end when being opened for grading purposes. The number of nails used per nailing edge has therefore been reduced from four to three in the ends of the lids, and from three to one in the sides of the lids.

Apart from a certain amount of starter difficulty, chiefly in the early weeks of the season, the average grade has been maintained at a figure equal to last year, and the amount of finest for the four months of the present season over last year shows an increase.

Butter quality shows a substantial increase in both the average grade and the percentage of finest.

* * *

Poultry Husbandry

MR. FREDERICK C. BOBBY, N.D.A., N.D.P., of Yorks, England, has been appointed Superintendent of Poultry Husbandry, Department of Agriculture. He succeeds the late Mr. C. C. Cussen.

Mr. Bobby was educated in England, and in 1915-17 and 1919-20 attended the Harper Adams Agricultural College, Shropshire, where he gained the National Diploma of Agriculture and College Diploma of Agriculture (with distinction). In 1924-25 Mr. Bobby, at the same college, gained the National Diploma of Poultry Husbandry and the College Poultry Certificate with distinction and medal.

Before gaining the National Poultry Diploma Mr. Bobby held a position on the agricultural staff of the Harper Adams College, which he left in order to obtain the outside practical experience in poultry necessary to qualify for the diploma. For three years after gaining the diploma he was Research Assistant at the National Institute of Poultry Husbandry, which he left to undertake the organisation and direction of an important private research

enterprise in connection with table poultry production. In addition, he has had extensive experience in commercial poultry farming, embracing both table and egg production on a large scale, having been manager of plants carrying from 10,000 to 20,000 birds.

Mr. Bobby has been highly recommended by the Principal of the Harper Adams Agricultural College, Newport, Shropshire, who says that he knows of no man as well qualified by training and experience for the direction of administrative, educational, and advisory work in poultry husbandry. He also states that as a teacher, Mr. Bobby was very successful whether in the class-room or on the public platform, and his many publicity articles have shown the same qualities of accurate, lucid, and attractive presentation.

Mr. Bobby served in the Army during the Great War between 1917-19 as a Lieutenant in the Oxford and Bucks Light Infantry.

It is expected that Mr. Bobby will arrive shortly to take up his new duties.

* * *

Research on Milking Machines

RESEARCH work on milking machines is in full swing at the Animal Research Station, Wallaceville. Experiments are being conducted to determine the effect of various adjustments in the operation of milking machines in the production of mastitis. Investigations are also being made into the relative efficiency of the different types of accessories available.

The collaboration of milking machine manufacturers and distributors is cordially invited. As indicated in the July issue of the "Journal," they may have any accessory capable of measurement by physical standards tested free, and receive a report on its performance. This should provide distributors with valuable data concerning the performance of their machines, and should assist manufacturers in providing improvements where these are necessary.

A number of dairy factories have placed orders for the mercury gauge to be installed for testing the accuracy of milking machine vacuum gauges. Unfortunately, considerable delay has occurred in providing these gauges because of the difficulty in obtaining mercury and the general disorganisation caused to manufacturers by war conditions. However, it is hoped that some 30 of these gauges will be available early in the New Year, and a list of the factories installing them will be published in a future issue of the "Journal."

A series of articles on milking machine accessories is being prepared by Mr. Whittleston, and will appear from time to time in the "Journal." It is hoped that these will prove of considerable assistance to dairy farmers and will enable them to understand better the mechanism of the various parts of a milking machine and the best methods of choosing them in order to ensure their most efficient operation in practice.

* * *

Tests of Honey

PROGRESS reports to hand indicate that the work of apiary inspection for the eradication of brood disease is progressing satisfactorily in all cases where part-time Apiary Inspectors have begun duty.

The good progress made by the bees during the early spring months has been somewhat offset by stormy weather conditions during November, with a consequent heavy consumption of stores.

With a view to helping bee-keepers in northern districts to overcome the honey-packing difficulties experienced in those areas, the Department has arranged this season with Dr. Cooper, Physical Testing Laboratory, to make certain tests of honey at various stages in the process of handling and packing by the bee-keeper, and also of the honey immediately the bees have completed their work of ripening and capping over for storage.

It is hoped that this work will lead to a solution of the problems and thus increase the quantity of honey available each year for marketing purposes, as large quantities of honey gathered from clover and mixed pasture sources are rejected at the grade store each year because of its poor keeping quality.

A. H. Cockayne

DIRECTOR-GENERAL.

Book Review

"Scientific Principles of Plant Protection"

"The Scientific Principles of Plant Protection with Special Rerference to Chemical Control." By Dr. Hubert Martin, third ed., x + 385 pp. 1940. Edward Arnold & Co., London. Price 22/6.

SINCE it first appeared this work has been accepted as the standard compilation on chemical control aspects of plant protection. The first edition appeared in 1928, the second in 1936, and the third in 1940, a striking illustration of its success, as few scientific publications run to a second, let alone third, edition.

The scope of the book may be indicated by the chapter headings which cover—Plant Resistance, Influenec of External Factors on Susceptibility and Liability of the Plant to Attack, Biological Control, Fungicides, Insecticides, Weed Killers, Fumigants, Seed Treatment, Soil Treatment, Toxic Actions and Chemical Constitution, Traps, Treatment of the Centres and Vectors of Infection. It concludes with an Author and Subject Index.

As a chemist, the author is at his best in those sections covering technical aspects of the chemical agents—therapeutants—employed in plant protection. Such materials are discussed fully, the history of their employment is given, together with their chemical composition and production, and effects on fungus and/or insect and plant

The book can be recommended to all who are interested in technical aspects of plant protection. It is of less value to the farmer or fruitgrower, as the practical aspects of spray programmes, dilutions and times of application have not been touched upon, nor is reference made to modern equipment used in application of chemical agents or protection.

—Dr. G. H. Cunningham, Director, Plant Diseases Division, Plant Research Bureau, Auckland.

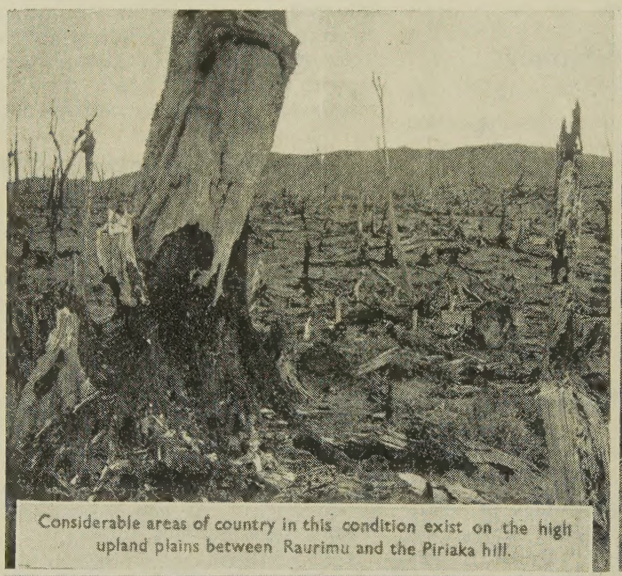
Log Clearing For £5 Per Acre

By
W. T. BROWN,
Fields Instructor,
Taumarunui.

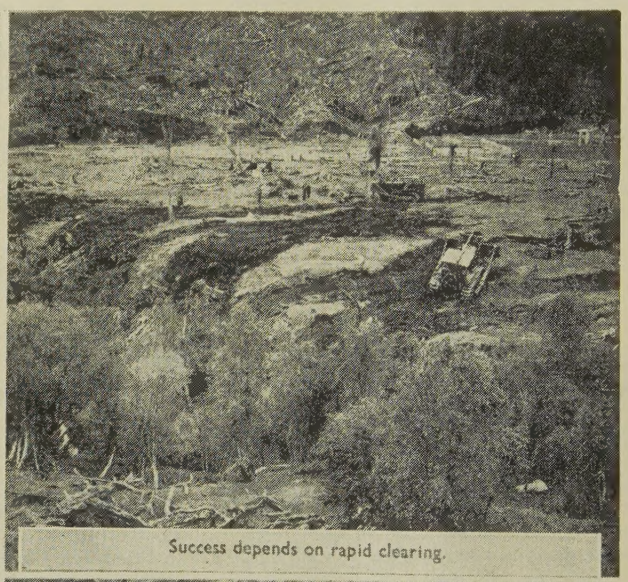
ONE of the first matters considered by the Taumarunui District Council of Primary Production in connection with increased production in the Southern King Country was the bringing in of land that had been felled out of bush some 15 to 25 years ago and which was carrying in general low-producing swards between the stumps and logs.

While it may have been considered by some that the bringing-in of this country was a long-term plan rather than the desirable short-term one, the council with its local knowledge of the position felt that if rapid stumping and logging up could be effected this country could give greatly increased returns within 12 months.

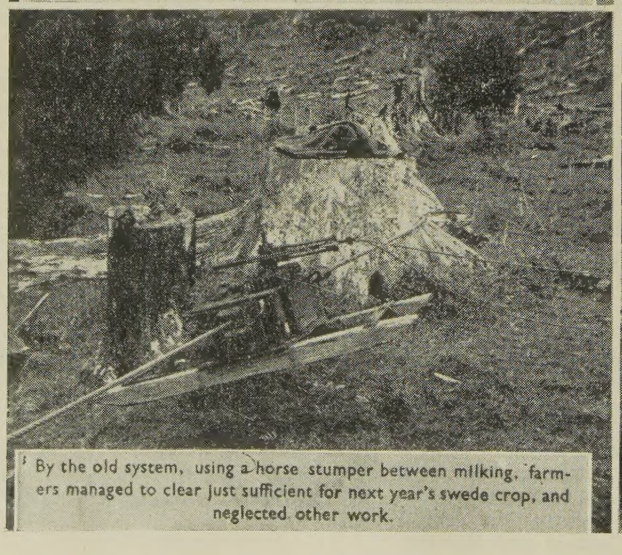
The council had as a guide similar country which had over a period been laboriously stumped and logged up by hand, and on which the pasture had been changed from a dry sheep one to a first-class dairying sward.



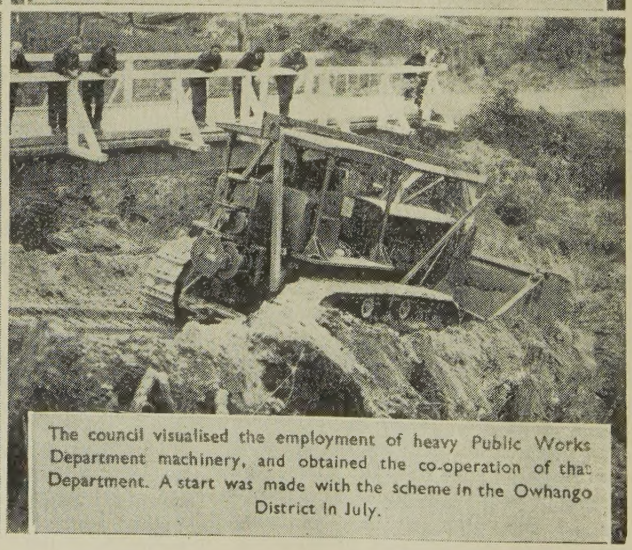
Considerable areas of country in this condition exist on the high upland plains between Raurimu and the Piriaka hill.



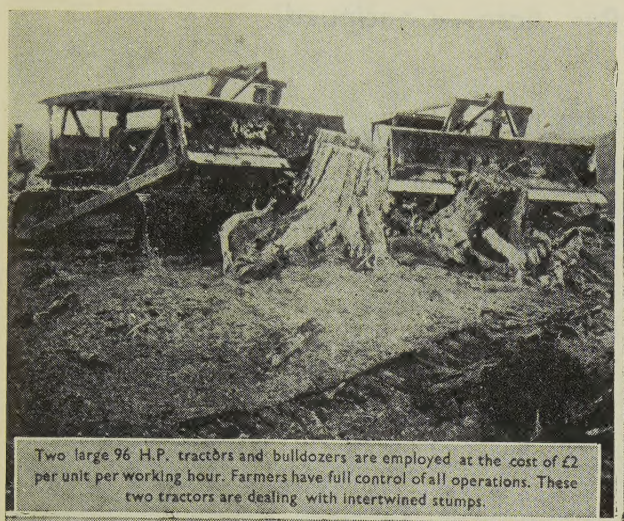
Success depends on rapid clearing.



By the old system, using a horse stumper between milking, farmers managed to clear just sufficient for next year's swede crop, and neglected other work.

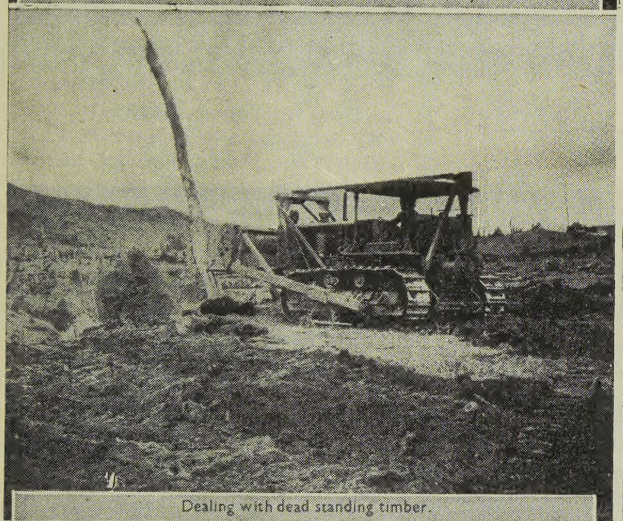


The council visualised the employment of heavy Public Works Department machinery, and obtained the co-operation of that Department. A start was made with the scheme in the Owhango District in July.



Two large 96 H.P. tractors and bulldozers are employed at the cost of £2 per unit per working hour. Farmers have full control of all operations. These two tractors are dealing with intertwined stumps.

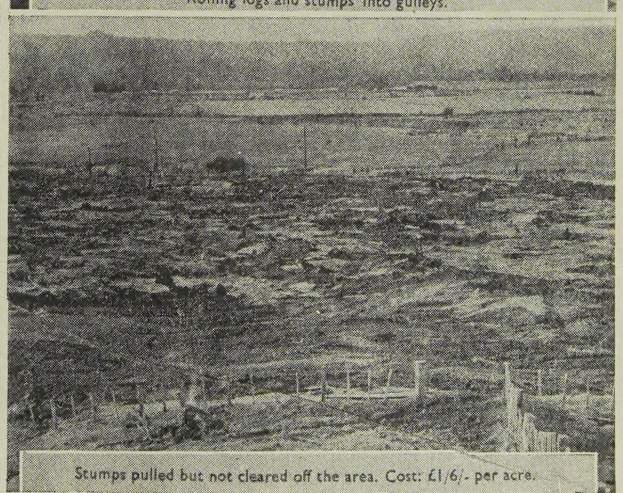
Stumping in progress. The stump measures 4 ft. across the top.



Dealing with dead standing timber.

Rolling logs and stumps into gulleys.

A horse stumper at work. Contract prices by this method vary from £10 to £15 per acre.



Stumps pulled but not cleared off the area. Cost: £1/6/- per acre.

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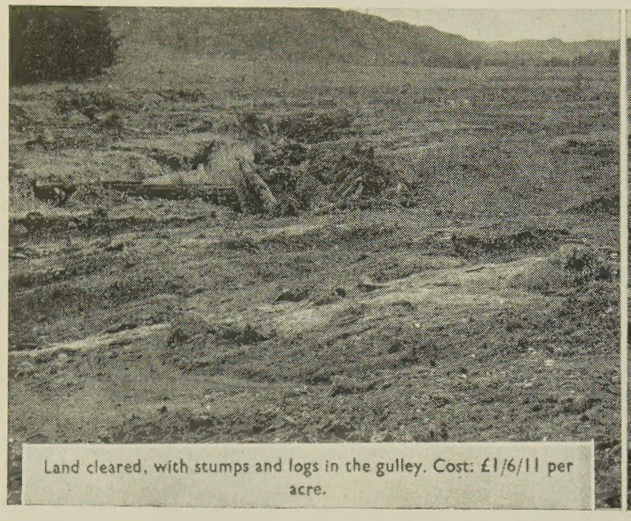
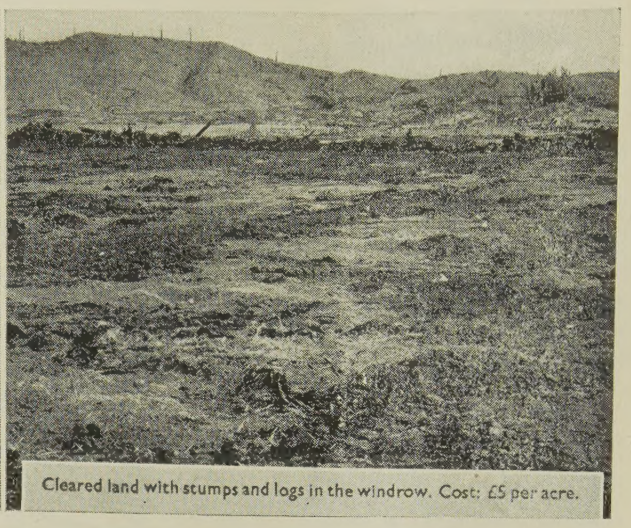
[Log Clearing for £5 Per Acre—Continued]



Land cleared, with stumps and logs in the gulley. Cost: £1/6/11 per acre.



Cleared land with stumps and logs in the windrow. Cost: £5 per acre.

Modern pasture calls for a high standard of management if the highest production is to be obtained. Emphasising the importance of perennial ryegrass in the sward, the author discusses several pertinent aspects of management.

Improved Management May Pay Better Than Increased Acreage

By P. S. SYME,
Instructor in Agriculture, Warkworth.

THROUGHOUT the long history of agriculture, where the plants of Nature's selection are replaced by those of man's preference, the land has ever demanded toil and sweat. When the farmer wants ryegrass and clover where Nature would have danthonia or manuka, he must be prepared to fight hard for his choice, and, if he is to win, he must use every weapon which modern research has given him.

The value of artificial fertilisers on grassland has long been recognised in New Zealand, and the progressive farmer has been quick to appreciate the benefit of the new certified strains of seeds. What, perhaps, is not so well recognised by some farmers is that the resulting high standard of the modern pasture calls for a correspondingly high standard of management if the highest production is to be obtained.

Most Valuable Grass Is Perennial Ryegrass

Whatever may be the opinion held in other countries regarding the merits of perennial ryegrass, here in New Zealand at any rate there is no doubt whatever concerning its value in dairying pastures, and the farmer who fails to take full advantage of this wonderful producer allows his strongest weapon to rust in disuse. Foxtail may be earlier, prairie grass may provide more winter feed, timothy or paspalum may be better summer producers. Each of these species, however, must be regarded as a specialist, excelling only in one line and calling for special conditions of soil, of climate, or of management.

Perennial ryegrass is a high producer, it is a good autumn grower, it makes fair winter growth under proper management, and its gets early away in the spring—all factors of very special value on a dairy farm. Moreover, ryegrass associates well with clovers, it stands up well to hard rotational grazing, and it can be made to thrive luxuriantly under a very wide range of soil and climatic conditions.

Considering its manifold virtues as an all-round producer of quite outstanding merit, farm management should certainly aim at making the best possible use of perennial ryegrass wherever conditions are suitable, and the various operations throughout the year should, if practicable, conduce towards the maintenance and improvement of the ryegrass as a major component of the sward. In general, this will almost invariably conform with good farming practice, and will lead both to higher production and to higher profits.

The various factors contributing to this end may be briefly grouped as follows:—

The use of good quality seeds.
Efficient topdressing and harrowing.
Suitable grazing management.

Only the Best Seed Is Good Enough

Just as the good strain of cow gives high production in the herd, so do the better strains of grasses and clovers give increased production in the sward. Quite apart from giving a better response to fertilisers and producing more feed, good certified strains have a longer growing season, and, under suitable conditions, they are truly permanent.

Admittedly, many pastures sown with uncertified seed in the past still carry excellent rye and clover. The use of uncertified seed, however, is attended with considerable risk, as the percentage of really permanent strains

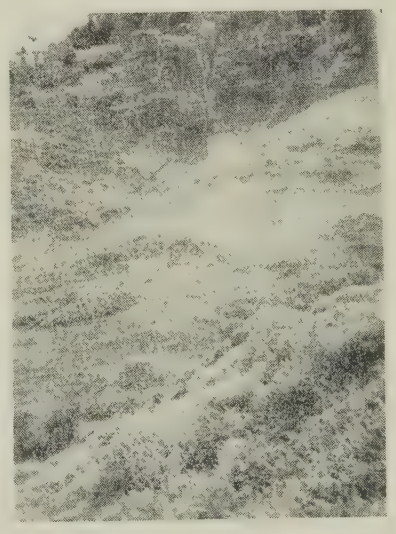


Fig. 1.—When plants of Nature's selection are replaced by those of man's preference, the land has ever demanded toil and sweat. Photograph shows reversion to bush and hard fern.

is liable to be low, and, even if present, much of it may be of a low producing type, which tends to run to seed stalks rather than to leafage. The question of improving an inferior sward by topdressing alone, by surface sowing, or by ploughing and resowing may be largely dependent on circumstances, or merely a matter of opinion.

Of the relative merits of high-quality certified seed as compared with cheap, uncertified lines of dubious pedigree and performance, there is no possible room for doubt. In the long run "cheap" seed is cheap only to the supplier.

Importance of Efficient Topdressing

Being a high producer, ryegrass must be correspondingly well fed, and its productive capacity and its ability to persist in the sward alike demand a relatively high level of fertility. Both field practice and research work have shown that the vigour of the ryegrass is very largely dependent on the amount of nitrogen available in the soil. For vigorous growth, the quantity needed is indeed high, and it may surprise some farmers to learn that if the whole of the nitrogen requirements had to be supplied artificially—as does most of the phosphate—the equivalent of about 1cwt. of sulphate of ammonia per acre would be needed every month. As sulphate of ammonia costs about £15 per ton, this would certainly prohibit such a dressing.

Fortunately, the clovers are themselves able to supply nitrogen much in excess of their own requirements, and a vigorous growth of clover can also provide all the nitrogen needed by the ryegrass. For this reason, ryegrass succeeds best as an associate with clover, and for this reason also, quite apart from their high feeding value, clovers form an indispensable element in a first-class pasture sward.

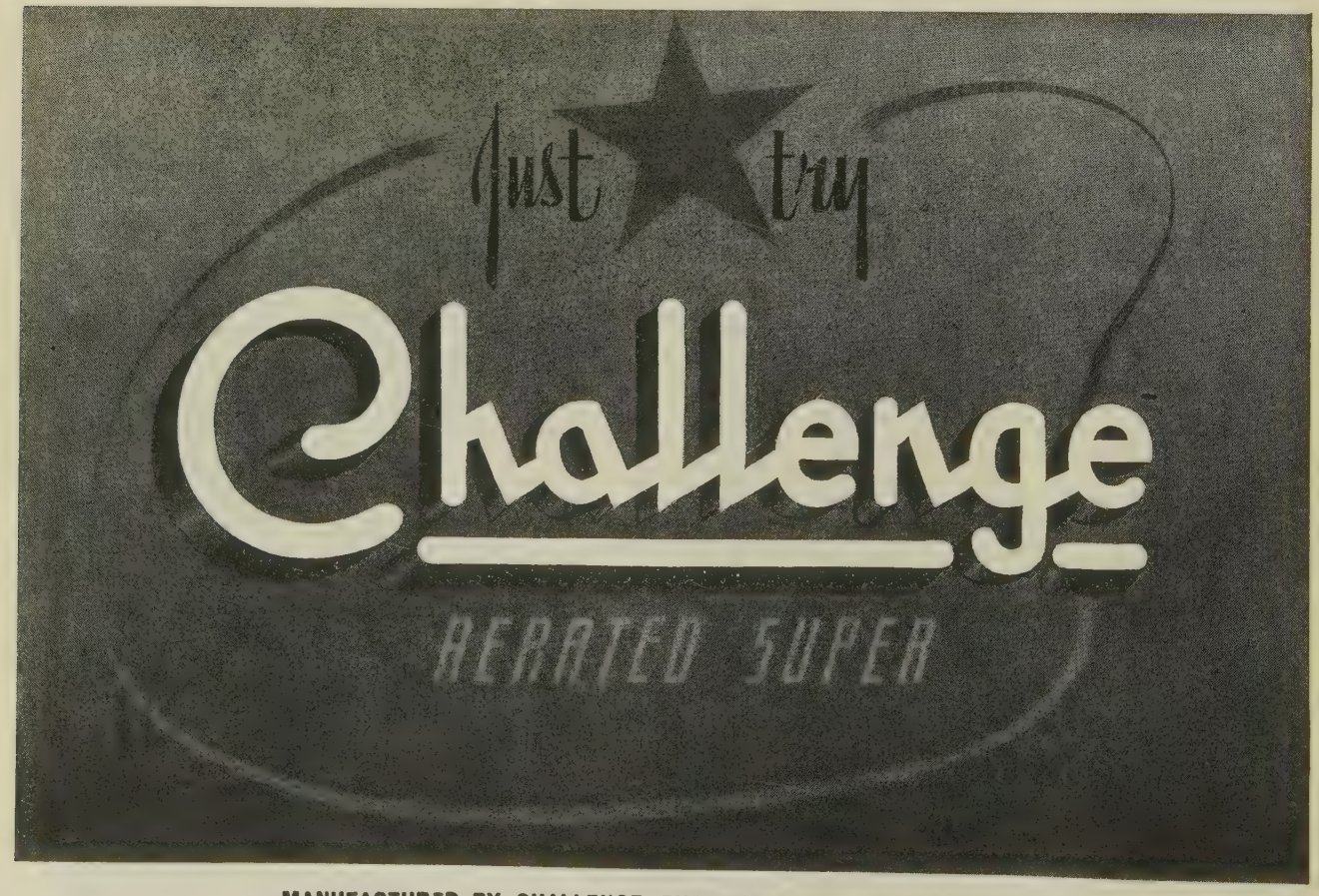
Ryegrass Needs Clover

It cannot be too strongly emphasised that while ryegrass can be made to grow on soils of low natural fertility, it succeeds only by virtue of the clover nitrogen. If clover is not present in sufficient abundance, ryegrass must inevitably fail.

This explains why, in a young pasture where clover has failed to establish, the ryegrass may quickly begin to look unthrifty and finally die out altogether. For this reason, every effort must be made when sowing down a young pasture to insure the quick establishment and vigorous growth of clover. This is doubly important when soil fertility is low.

Topdress for Clover

While clover is largely independent of applied nitrogen, it is extremely sensitive to any deficiency of lime, phosphate, or potash, and as New Zealand soils are very generally deficient in phosphate, this has become the most widely used type of fertiliser for topdressing. Important as it is for plant growth, phosphate is necessary also for the grazing livestock, and this sometimes explains the depraved appetite



MANUFACTURED BY CHALLENGE PHOSPHATE CO., LTD. AUCKLAND

and fondness for bones occasionally shown by animals grazing on un-topdressed country deficient in phosphates.

Most of the phosphatic fertilisers on the New Zealand market can be expected to give good results on any farm, but just which will prove most profitable depends on the price charged and on local conditions of soil and climate, so that the selection can best be determined by experience.

Lime Is Important

The part which lime plays in the development of a strong skeletal structure in growing stock, as well as its supreme importance for cows in milk, has long been recognised. Analyses of herbage samples have shown that the bulk of this lime is supplied in the clover, and it is certainly the clover element in the pastures which benefits most from lime. White clover will fail completely in acid soils, and until the acidity has been reduced by an appropriate dressing of lime, money spent on fertilisers may be very largely wasted.

Moreover, on certain lime-deficient types of soil, lime appears to be necessary to combine with the soluble phosphates to prevent their becoming fixed in the soil and lost as plant food. When it is remembered that much dairying land is naturally deficient in lime, and that every shower of rain and every mouthful of herbage eaten represents a drain on the soil's available store of lime, the necessity of its periodic renewal on soils where it is apt to be deficient should not be overlooked.

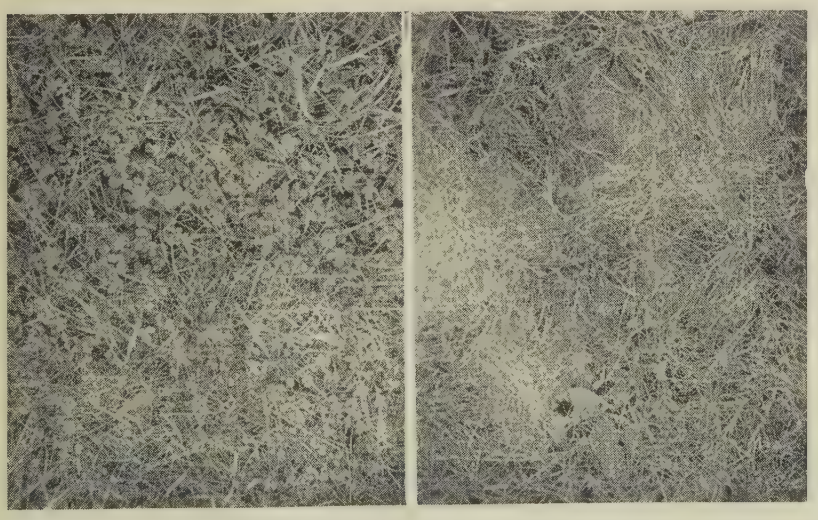
Fig. 2.—Failure of young pasture due to lack of clover. Where the clover fails the ryegrass quickly suffers from the lack of sufficient nitrogen. Note the absence of clover and the poor, unthrifty appearance of the ryegrass.

Potash

In view of the restricted supplies it is fortunate that New Zealand soils generally are by no means seriously deficient in potash, and the network of trials laid down by the Department of Agriculture has shown that any deficiency is mainly confined to certain districts in Taranaki and Southland, and to limited areas near Hamilton and Waihi. Where potash is deficient, however, it will invariably be found that clover gives only a moderate response even to generous applications of lime and phosphate, and until the potash deficiency has been made good, money spent on other fertilisers gives a very inadequate return.

Experience commonly shows that a serious potash deficiency is seldom to be expected on heavy soils, and where it does occur, it is very generally associated with soils of a light porous texture. On such soils, truly remarkable responses in the vigour and density of the clover growth have followed the application of potash, and thus improvement of clover is quickly reflected in improved growth of the associate grasses.

Where clovers fail to respond to lime and phosphates, potash deficiency may be suspected, and if, in addition, the soil is light and sandy, such a deficiency may be regarded as highly probable. This can best be confirmed by an actual trial, and, if there appears to be reasonable room for doubt, the trial should be conducted on a relatively small scale to avoid undue waste because of the war-time scarcity of potash supplies.



Figs. 3 and 4.—Good seed is very important. These two pastures were sown down on the same day, and received identical treatment. The difference in quality is entirely due to the seed. No. 3 was sown with good certified rye and white clover, while No. 4 was sown with low quality seed of unknown pedigree.

Importance of Harrowing

Even though the land is generously topdressed, the part played by animal droppings in maintaining a high fertility level must not be forgotten. Animal droppings may be regarded as Nature's complete fertiliser, and, in the aggregate, their proper utilisation exerts a tremendous influence in the maintenance of fertility. If the harrowing is neglected, however, much of this free fertiliser is altogether wasted,

and its effect on the sward may, in some respects at any rate, prove actually harmful.

The use of the harrows when conditions are suitable should properly be regarded as a very important part of the routine work of a dairy farm, and never as a somewhat perfunctory and humdrum operation to be performed only when the farmer can find no other employment.

Clovers as Index to Topdressing Efficiency

Mention has already been made of the relationship between clover and the nitrogen supply, and whichever fertilisers may be used, their main object must be to promote vigorous clover growth. This, in turn, raises the fertility and maintains it at the ryegrass level. It will be found in ordinary practice that the efficiency of the topdressing can generally be very accurately assessed by the vigour of the clover. Provided the demands of white clover are fairly met, it may be safely assumed that the needs of the ryegrass too are being well catered for.

Apart from the varieties of the fertilisers used, it must not be forgotten that the actual time of application may also be important. Normally, although fertilisers may sometimes have a particular value when applied for special purposes in the spring or summer, the common practice is to topdress in the autumn. Just which is the best time in the autumn is frequently dependent on season, locality, and sward, but when the sward carries an appreciable proportion of winter-growing grasses, such as ryegrass, and when winter growth is to be specially encouraged, the fertiliser should be applied while the soil is still warm, and while there is still a prospect of vigorous and active growth. This aspect, as will be explained later, is of particular importance from the point of view of winter grazing management.

Fig. 5.—Both ryegrass and white clover demand high fertility, and neither can be expected to succeed without generous topdressing.

(To be continued.)

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KEEPING BLACKBERRY IN CHECK

Spraying blackberry in and along a drain for 10ft. back from the edge.

Spraying With Chlorate Weedkillers Has Proved Effective And Economical

BLACKBERRY is one of the worst weeds with which the New Zealand farmer has to contend. In the heavy rainfall districts, and on our relatively undeveloped country its control is a serious problem. New Zealand farmers have adopted a number of methods of control.

Use of Goats

On low production pastures, especially on hilly country, some farmers have utilised goats to keep the blackberry growth in check. The November, 1939, issue of the "Journal of Agriculture" contains an interesting article on the valuable work performed by goats in the preliminary stages of clearing land badly infested with blackberry. The use of goats is usually conceded to be a "stop gap" method, and more positive methods of control are now available.

Burning and Cutting

Up to the present, the most common method of attack, especially on hilly, stumpy, and log-strewn land, and, in fact, on unploughable land generally, has been to cut the blackberry with a slash-hook and burn off. This treatment is followed by the sowing of a suitable seed mixture and topdressing. An effort is made to stock the area as heavily as possible, especially in the early spring, when sheep and all types of cattle tend to eat or trample the young tender shoots of the blackberry regrowth. Many dairy farmers have adopted the practice of feeding out hay on the burnt-over areas, and this practice is well worth while.

Blackberry has tended to disappear on our more intensively and better farmed country, even if the land has not been ploughed. As the land has been subdivided, topdressed, and surface-sown, the stock-carrying capacity has increased, and the stock have helped to control the weed. As farming has intensified the farmer has been able to give closer attention to the blackberry patches on his land.

— *By* —
K. M. MONTGOMERY,
Fields Instructor, Te Kuiti.

Control by Ploughing

On ploughable land the control of blackberry presents no insuperable difficulties. Large areas of blackberry-infested land have been cleared by ploughing, cropping for a year, and resowing to grass. In some cases the land has been ploughed, worked, and sown to grass in the same year. Heavy topdressing and carefully controlled heavy stocking of the new pasture help to complete the eradication.

Where the blackberry is very high and dense, many farmers adopt the practice of rolling the blackberries down with a tractor, burning off the crushed canes, and then completing the work by ploughing, sowing, and topdressing.

Control by Spraying

In spite of our past efforts very large areas of blackberry remain uncontrolled or only intermittenly controlled. On our poorly developed country the weed continues to spread rapidly, mainly because of the cost of clearing and the fact that the returns from low carrying capacity land allow little margin for a costly attack on weeds.

In the more intensely farmed high rainfall areas blackberry remains as a flourishing weed of wayside and waste places. Roadsides, drainsides, rough gullies, edges of bush and of plantations, and swamps frequently carry a heavy infestation of blackberry. From these out-of-the-way bushes the seeds are carried by birds and by water to other land.

As the present war progresses and farm labour becomes more difficult to

obtain there will be less labour available for weed clearance; certainly there will be less labour available for the present inefficient and costly method of cutting and burning. The annual cutting of blackberry is often little better than pruning, as the regrowth each year is practically as strong as that removed the year previously.

Fortunately, the spraying of blackberry with sodium chlorate or Atlacide has proved to be effective and economical. Spraying can more quickly be carried out than cutting or grubbing. There is some outlay for the purchase of the weedicide and for the spraying outfit, but the time saved more than compensates for these costs.

Blackberry growing along an open drain, where it is a menace to good drainage and a source of supply for future plants.

Spraying Apparatus

There are a large number of different types of spraying outfits available for farmers' use, ranging from hand spraying pumps to power-driven spray plants. In many cases the bucket and spray pump used in the orchard or garden can be used for treating small areas. A knapsack sprayer will prove most suitable for the average farmer.

The Danger Factor

One of the great advantages of chlorate weedkillers is that they are more or less non-poisonous to stock, whereas arsenical weedicides are extremely poisonous. Nevertheless, great care must be taken when applying sodium chlorate as a spray. The spray mist tends to soak into the worker's clothes and boots, and when they dry out they are very liable to take fire and burn fiercely. The clothes worn should be as waterproof as possible and they should be washed thoroughly at the end of each day's work. Atlacide is a chlorate weedkiller which has been fireproofed to a considerable degree, but even with Atlacide the clothes should be well washed at intervals.

For dry dusting, a mixture of one part sodium chlorate mixed with up to 20 parts of carbonate of lime is used, as the admixture with lime fireproofs the sodium chlorate. Care has to be taken that the sodium chlorate dust is washed out of the clothes at frequent intervals.

Dry Dusting v. Spraying

There can be no doubt that for blackberry the spraying method gives the best results. A better cover of the leaves and stems is obtained, and consequently a better kill results. Even when the dry sodium chlorate is mixed with 20 parts of lime, experience shows that more sodium chlorate is needed for dry dusting a given area than for spraying.

Strength of Solution

A 5 per cent. solution of sodium chlorate or Atlacide is generally used, that is, 1 lb. in 2 gallons of water. In dry dusting, which is not recommended, a mixture of 1 part sodium chlorate and 19 parts of agricultural lime are used.

Amount and Costs

The best guide to the amount required to spray a given area of blackberry is the fact that the leaves and stems of the plants should be thoroughly wetted. Obviously, it is not possible to wet the stems in the interior of thick bushes, although the spraying lance can be thrust into the bush in some places. For dry dusting, sufficient of the 1:19 mixture is required to apply a little more than 1 oz. of sodium chlorate to the square yard, that is, to apply about 3 cwt. of sodium chlorate to the acre. As

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The same stretch of drain as in Fig. 1. two years later. Note the growth of cocksfoot where the blackberry formerly grew.

sodium chlorate costs the farmer about 50/- per cwt., this method is expensive, costing £7/10/- per acre for the weedicide alone.

The spraying method, however, is much cheaper. Even if as much as 336 gallons of 5 per cent. solution is applied to the acre, this results in the application of only 1½ cwt. of sodium chlorate per acre at each application, costing approximately £3/15/- per acre. The amount of spray used per acre depends, of course, on the size of the blackberry bushes to be sprayed.

Time of Application

The time of application is an important factor. The spray should be applied in dry weather at any time during the summer or autumn. Spraying while the berries are green gives the plants a hard knock. Spraying in the autumn when the sap is flowing back to the roots tends to result in a better root kill.

Treatment of Regrowth

There is some diversity of opinion as to the best method of treating the blackberry plants after they have been sprayed. If the spray has "taken" well the whole of the topgrowth is soon brown and dried up. Some observers consider that the bushes should be left and the regrowth sprayed, but if the bushes are thick the dead growth hinders the spraying of the regrowth. Practical experience shows that the best method is to burn off the blackberries as soon as the bushes are dry and wilted. On peaty ground, burning should be carried out only in the winter.

In the case of drains which have to be cleaned, it is necessary to burn off the dried topgrowth in order to get at the drain for cleaning purposes. Once the blackberry is burned the land should be sown down in a suitable pasture mixture, topdressed, and stocked where possible. Even if the land is not stocked, the growth of grass tends to smother the blackberry to some extent.

Blackberry is a serious problem in the Te Kuiti area, and the writer has conducted an experiment on its control in this district. The experiment was started in December, 1938, and experimental bushes were selected: (1) on a drainside, and (2) on a drier hillside.

Sodium chlorate and Atlacide sprays were tried at 1, 5, and 10 per cent. strengths. A dust consisting of sodium chlorate 5 parts and lime 95 parts was also applied to some plots, so that the same amount of sodium chlorate was applied per square yard as was applied in the 5 per cent. solution. Washing soda was tried as a 5 per cent. solution spray, and pure, dry applications of washing soda were also made to the cut ends of blackberry stalks.

Results

It is not intended to give here the full particulars of this experiment, but as a result of this trial and from general experience in the district the following conclusions are drawn:—

(1) The spraying method gave the best results.

(2) The dry dusting method is not recommended.

(3) The kills were slightly better on the dry hillside than along the drain.

(4) The washing soda applications were useless.

(5) The sodium chlorate and Atlacide sprays gave results in proportion to the strengths used. For instance. 5 per cent was better than 1 per cent. In general, it was concluded that a 5 per cent. sodium chlorate or Atlacide solution gave the most satisfactory results.

(6) There is less fire risk with Atlacide than with sodium chlorate sprays.

(7) It was concluded that the best method to adopt is to spray in the summer or autumn and then burn off. The regrowth should then be resprayed in the following summer or autumn. Usually, blackberry bushes cannot be completely killed by one spraying and burning.

(8) The burnt-over area should be sown down, topdressed, and stocked.

(9) Feeding out hay on the burnt-over patches is helpful.

(10) One of the outstanding features of the experiment was that it is obviously much cheaper and more effective to spray and burn blackberries than to prune them annually. In some drainage areas it has been found that blackberry-infested drains which cost 13/- per chain to clean each year now cost only 3/6 per chain due to the fact that the blackberries have been almost eradicated by one spraying in each of three successive years.

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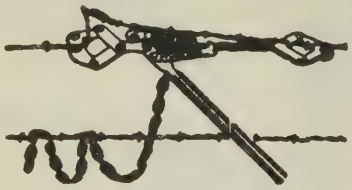

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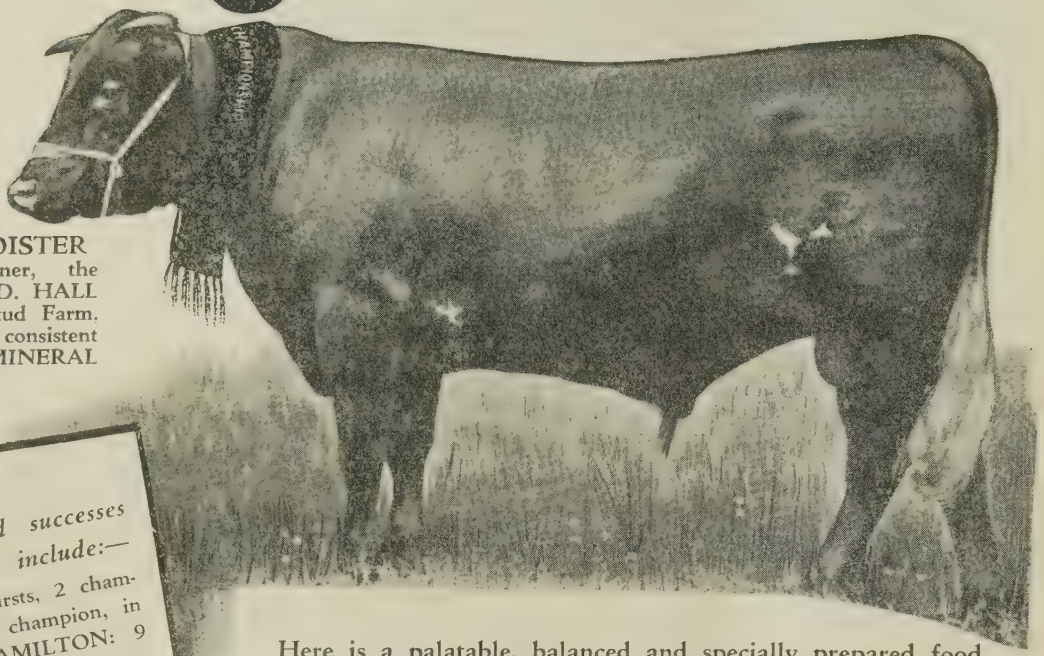

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How Your Milking Machine Works

Importance Of Relief Valves

By W. G. WHITTLESTON,
Animal Research Station, Wallaceville.

(*Continued from the December issue.*)

Devices for Controlling the Vacuum In Milking Machinery

Construction

One ingenious device for maintaining a constant vacuum in a milking machine employs a mercury gauge as the regulating mechanism. (See Fig. 7.) A poppet type valve (1) is held closed by an arm (2) weighted by an adjustable weight (3) and a mercury container (4). The latter contains the mercury reservoir of the column (5), whose upper end is connected to the vacuum pipe. The movable weight is set so that when the mercury rises to the desired height the valve admits air into the pipe line by lifting the weight (3). The height of the mercury can be read off from a graduated scale (6), so that the device combines an accurate mercury gauge with a relief valve.

Another method of maintaining the vacuum constant in a milking machine is the use of a reducing valve (see Fig. 8). The general principles of such a device may be understood from the accompanying sketch. The device is a valve (1) seating at (2) and operated by the flexible diaphragm (3), the whole being housed in the casting (4). A flexible compensating diaphragm (5), whose outer surface is connected by the channel (6) to the low vacuum side of the valve at (7), operates against the main diaphragm in a manner to be explained shortly. The valve (1) is held open by the tension of the spring (8), which can be varied by the wing-nut (9). The device is connected to the pump by the connection (10), while connection (11) leads to the milking machine.

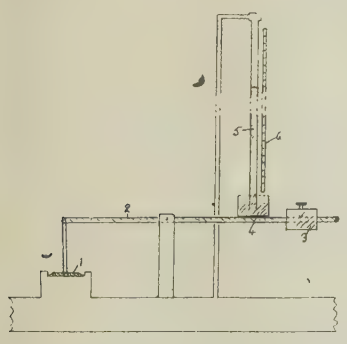

Fig. 7.—Construction of mercury gauge vacuum controller.

Action

The action of the device is as follows:—

Firstly, let us assume that the machine is not milking and that only a small amount of air can be admitted into the vacuum pipe. As the pump removes air through the open valve (1), the pressure falls, atmospheric pressure causing the diaphragm (3) to act against the spring (8) and so close the valve. This process continues until the vacuum in the machine closes the valve enough to admit of no more than sufficient air passing to maintain the vacuum at the desired level, the latter being determined by the tension on the spring (8).

Now, suppose a larger quantity of air is permitted to flow. The vacuum tends to fall in the machine, causing the valve to open and admit more air from the high vacuum side to maintain the vacuum in the machine constant. In this consideration we have omitted to mention the compensating diaphragm (5). Let us omit it and suppose there is a sudden rush of air into the machine. The vacuum drops on the low vacuum side to a low level, causing a large drop across the valve (1). This will, if the drop is sudden, close the valve, causing an even greater drop in vacuum, and the machine will stop working.

Now let us examine the action of the compensating diaphragm. If a sudden drop occurs the pressure rises below the compensating diaphragm, forcing the valve open and offsetting the effect of a pressure drop across the valve. The valve can then open widely and admit enough air to maintain a constant vacuum.

In other reducing valves using the above principle the need for a compensating diaphragm is eliminated by using a valve not seriously influenced by the difference in vacuum across it, such as a slide valve. The objection to the latter, however, is loss of sensitivity due to friction between the sliding valve faces, this friction tending to increase with the vacuum drop across the valve.

In general, it may be said that a reducing valve is theoretically preferable to a relief valve as a means of controlling the vacuum in a milking machine. The amount of power consumed by a piston type of vacuum pump is roughly proportional to the amount of air it handles. When a

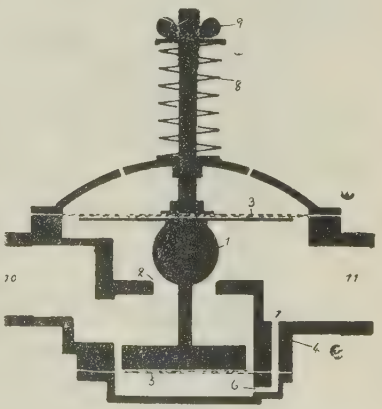

Fig. 8.—Construction of vacuum reducing valve.

relief valve is used extra air is admitted into the machine when the vacuum rises, increasing the load on the pump. With a reducing valve, however, only that amount of air required to operate the plant is admitted at any time, so that the power consumed by the pump is kept at a minimum. Further, particularly if the reducing valve is between the vacuum tank and the machine, if there is a sudden rush of air due to cups falling off the valve opens suddenly, admitting as much extra air as possible to maintain the vacuum steady. The present objections to vacuum reducing valves are cost, complexity, and the fact that there is a real economy in power costs only when a reciprocating type of vacuum pump is used.

Valve Designed

Some time ago, at the suggestion of Mr. A. Leslie, Chief Veterinarian to the Taranaki Federation of Co-operative Dairies, the writer designed a relief valve which was essentially an improved poppet type valve. It was designed with a view to complying with the following points:—

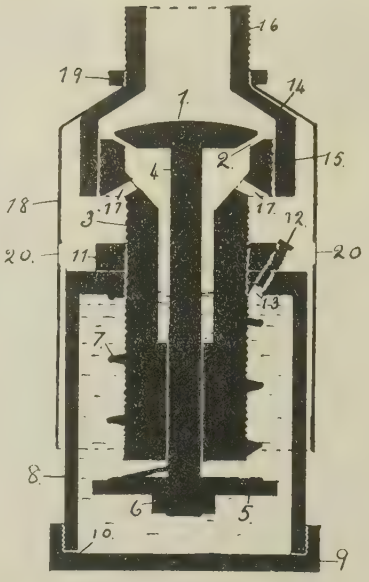

Fig. 9.—Construction of experimental relief valve.

(1) The spring must not corrode.

(2) The valve guide must be continuously lubricated.

(3) The valve should be lockable to prevent unauthorised tampering.

(4) Air passing into the valve should be trapped so that any large dust particles are removed.

The accompanying sketch and photograph illustrate this valve (see figs. 9 and 10).

Construction

The construction of the valve is as follows:—

The valve is of the poppet type, whose head (1) makes a ground fit with the seat (2), which is integral with the main body of the valve (3). At the other end of the valve stem (4) a plate (5) is screwed and locked firmly by the nut (6). The valve stem slides in the main body (3), being guided only by the lower portion, the upper portion surrounding the stem being drilled out to give ample clearance round the valve stem. The valve

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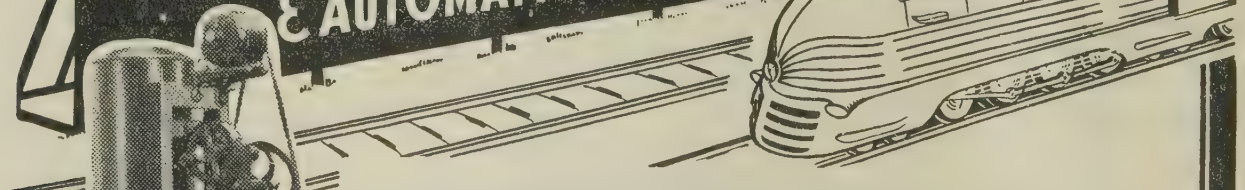

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..... J.A.

is held against its seat by the spring (7), whose upper end rests in a groove cut in the top of the oil container (8). The oil container (8) screws on to the main body (3), and is closed at the bottom by the cover (9), which screws tightly on the container, making an oil-tight joint at (10). The tension on the spring is adjusted by screwing the oil container up and down on the main body. The adjustment is locked by the nut (11), which is prevented from turning, once tightened, by the screw (12), which also serves to block the oil-hole (13). The tension on the spring is such that for normal use the valve guide is immersed in oil, giving continuous lubrication. The valve is covered by the chamber (14), which screws tightly on at (15), its upper portion (16) screwing into the air pipe of the milking machine. Air is admitted behind the valve by the ports (17). The whole of the valve is covered by the jacket (18), which is held in position by the lock nut (19). In the cover are holes at (20) through which air may pass. These holes are staggered with respect to the ports (17), so that dust entering the valve is partially trapped.

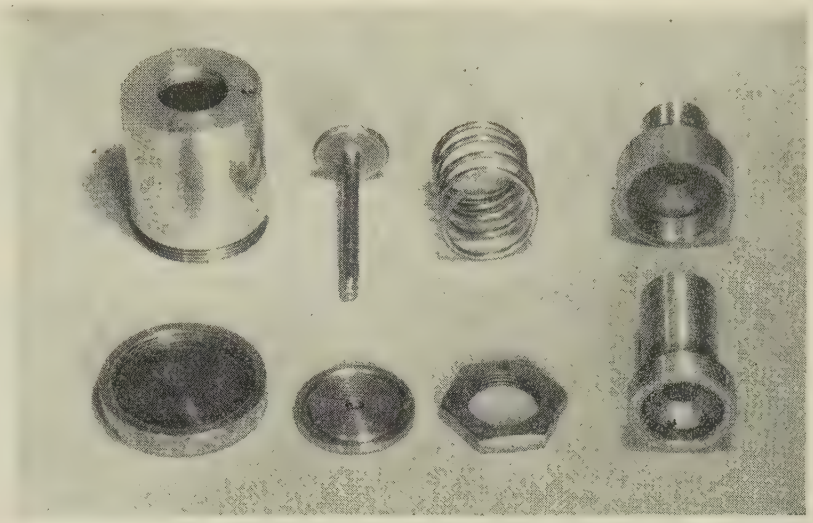

Fig. 10.—Components of experimental relief valve.

Action

The valve is exactly the same in action as an ordinary poppet type valve. For maximum efficiency the valve should be mounted vertically so that the oil chamber hangs below the threaded portion attaching the valve to the machine. One object in using the cover (18) is to prevent the valve being tampered with. The valve is adjusted to blow-off at the right vacuum without the cover on. The lock nut is then screwed up tightly and the locking screw inserted. The cover is then put on, the locking collar screwed up tightly, and the valve screwed into its correct position on the machine.

The oil container is filled with a light machine oil; separator oil has been found satisfactory. Once filled, the valve requires practically no attention if mounted correctly, and gives very reliable performance.

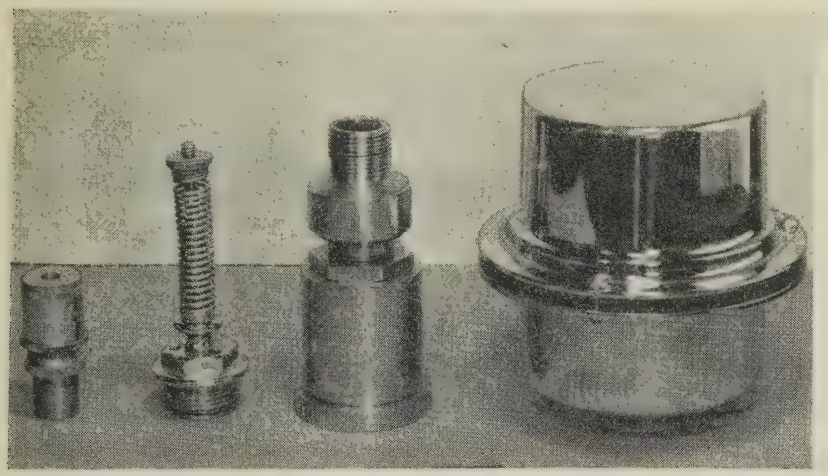

Fig. 11.—A photograph showing the related sizes of different types of relief valves.

Performance

Some idea of the performance of this valve will be gained from the following figures. These figures give the vacuum

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at which the valve opens and the maximum vacuum to which the testing apparatus rose, indicating the degree of control of the valve under the specified conditions. As soon as practical, details of a method of testing relief valves and the performance of many types will be published.

TEST PUMP. REVOLUTIONS PER MINUTE 178.

Poppet Valve (No. 1)—Mean opening vacuum equals 14 2-3 in.; mean maximum vacuum equals 16 in.

Poppet Valve (No. 2)—Mean opening vacuum equals 6 2-3 in.; mean maximum vacuum equals 16 2-3 in.

Ball Valve (No. 3)—Mean opening vacuum equals 10 11-12 in; mean maximum vacuum equals 17 in.

Our Own Valve—Mean opening vacuum equals 14 1-3 in.; mean maximum vacuum equals 15 in.

Present Research

At present work is being carried out on a new type of relief valve employing a diaphragm and a very simple, adjustable valve. This valve has a high sensitivity, but before more work is carried out a detailed description seems unnecessary.

Position of Relief Valve On Milking Machine

The position of the relief valve on the machine is important because of its effect on the efficiency of the valve. The following is a brief discussion on the usual practices in this connection, consideration being given to the effect of the position on the behaviour of the valve.

On the Pump

The chief objections to the placing of the relief valve on the pump arise from the nature of the vacuum in the machine at this point. With either the reciprocating or rotary type of pump there is a distinct fluctuation in the vacuum between the pump and the vacuum tank. This means that the relief valve attempts to control a vacuum whose maximum peaks may be well above the desired vacuum and whose lowest points may be well below. If the valve is opening during ordinary milking conditions it means that more air is being admitted than is necessary during the peak periods, as the peaks will be subsequently "ironed-out" by the vacuum tank.

This loss of air is primarily caused by the fact that ordinary relief valves cannot follow rapid cyclical changes in vacuum quickly enough to close properly every time the vacuum drops. Further, the movement of the valve under these conditions causes unnecessary wear. A further practical point is that when an ordinary relief valve is put on or near the pump it is well away from the farmer's attention, and so is liable to be neglected.

On the Vacuum Tank

The foregoing objections disappear in the main when the relief valve is placed on the vacuum tank, for at this point the vacuum is relatively stable. However, there is serious risk of contamination in this position. The hot alkaline washing solutions coming into the vacuum tank splash considerably, and the valve is bound to come in contact with the liquid.

On the Milk Line

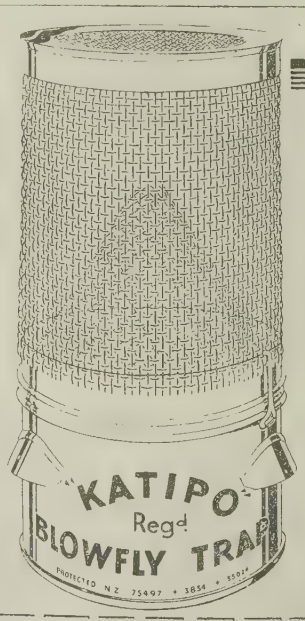
There are one or two mechanical advantages in placing the relief valve on the milk line, but these are more than offset by the fact that in this position the valve is liable to serious contamination. Milk spray and froth can be carried into the valve, causing highly undesirable corrosion, not only detrimentally affecting the performance of the valve, but also causing grave contamination of the milk. When the gauge is mounted beside the valve the position is even worse. It is claimed by some that mounting the relief valve between the gauge and the milk pipe helps to keep the former clean, due to the stream of air passing through the latter. This may be partly true, but no cognisance is taken of the fact that it is when the vacuum drops and the relief valve closes that the danger of contamination is greatest, for it is then that milk is sucked back into the gauge.

On the Air Line

When possible, it is desirable that the relief valve should be on the air line. It is a sound position mechanically, contamination is at a minimum, and the gauge and relief valve can be situated side by side in a position in which they can be seen by the farmer during milking.

Single Pipe Machines

In the case of single pipe machines a compromise has to be effected. The best arrangement in this case is to have the gauge and the relief valve either on the vacuum tank or on the pipe between the releaser and the vacuum tank.



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In this article the author describes a visit to a farm where sheep are being employed with great success in eradicating gorse. The method, in some respects, is novel, and although most people would be inclined to doubt its chance of success, an Auckland farmer has shown that the system does yield good results.

Eradicating Gorse With Sheep

By J. E. BELL,
Instructor in Agriculture, Auckland.

AFTER my preliminary article on gorse and blackberry, which appeared in the "Journal of Agriculture," February, 1939, an article appeared in the November, 1939, issue, page 435, entitled "Stamping Out Gorse With Cattle," showing what could be done with cattle in the eradication of the plant. My concluding sentence ran as follows:—"After seeing the work done by dairy cows on Mr. Armstrong's farm, I came to the conclusion that cattle used intelligently are not so useless after all as controllers of gorse, and that the vaunted superiority of sheep over cattle in this direction is not so well established."

Recently I have been on a farm where sheep are being employed with great success in eliminating gorse. The method, in some respects, is novel, and most people would be inclined to doubt its chance of success. The method adopted is as follows:—

Method Adopted

The gorse is cut as close to the ground as possible in the spring. For heavy gorse an axe must be used, while a heavy slasher can be used for smaller gorse. It is important to cut close to the ground, and the aim should be to cut to within, at the most, two inches of the ground level. The area is fired at a time when a good strike of grass is assured from a burn. The time of firing varies according to soil and climate.

In moister climates early sowing can be carried out with little risk of failure, but where the autumn rains are fickle, later sowing to make sure of catching them is necessary. In the sowing of burns, one must be very careful to ensure that the germinating grass and clover will secure an adequate supply of moisture. On a cultivated soil conditions are much different, and early sowing is not nearly so risky as regards the supply of moisture. A dressing of fertiliser must be given at sowing time to give the grass and clover a good start and to make them and the gorse seedlings (which will be there in their millions) palatable to the sheep.

The sheep, preferably from hard country and of a class which stands punishment, are crowded on to the area as soon as the grass seed sowing is finished. Both the gorse and the grass are kept fed down constantly to the ground, and this must be adhered to until the gorse has given up the fight. This will take about two years, the gorse being replaced by the grass and clover as they spread over the ground. A few cattle will be required to run ahead of the sheep to keep down other growth, such as fern, which will afford shelter to the gorse.

The gorse must be always accessible to the close biting teeth of the sheep. To allow this accessibility after the burning and sowing have been completed, the burn should be cleared of all sticks and rubbish, and if necessary a hand rake should be used to make a proper clearance. Gorse sticks or other rubbish left lying on the ground will shelter the gorse and will cause much more work in grubbing and cutting later on.

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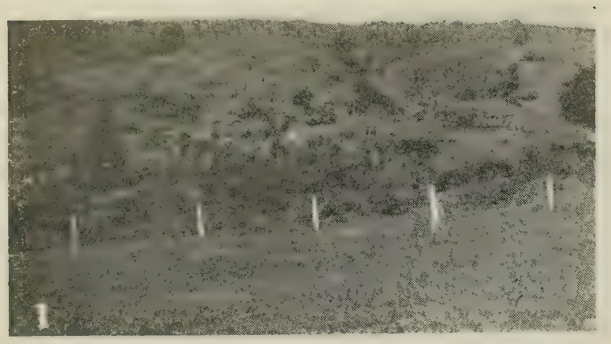

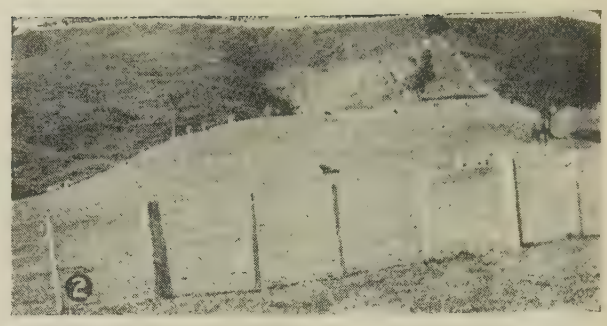

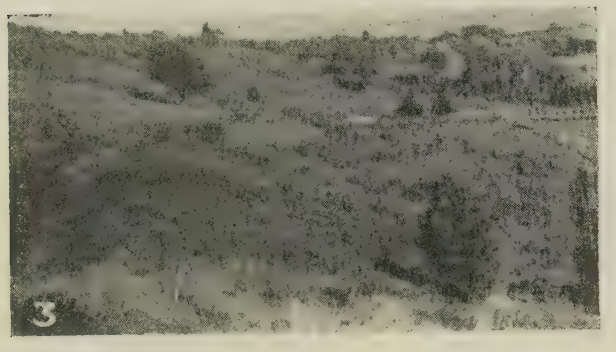

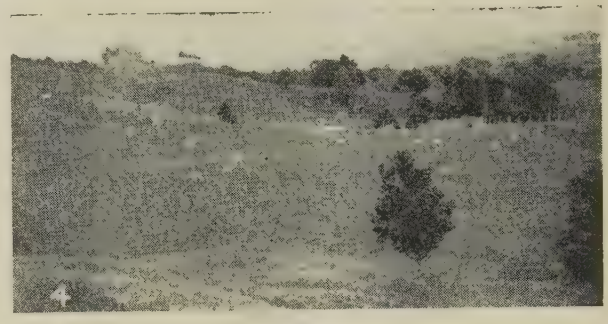

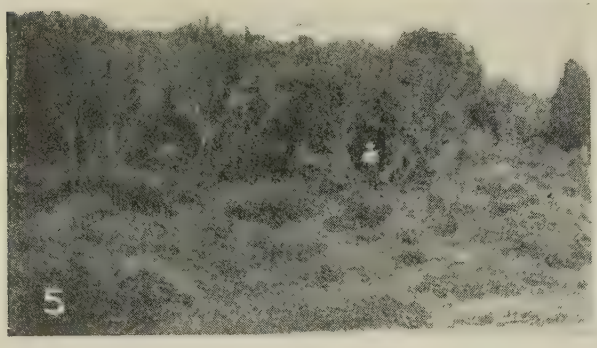

Contrasts

These photographs show contrasts of scenes. In each case the illustration on the left shows the area before burning and sowing, and the illustration on the right shows the same area as it is to-day.

In *Figs. 1, 2, 3 and 4* the area was sown in the autumn of 1939. The sowing was followed by a long period of dry weather, during which the gorse germinated while the grass and clover seed did not. Before burning the gorse was fairly scrubby and poor in growth. Conditions were poor for gorse control, and some of the seedlings and growth from stumps have grown into the spine stage. This is the worst controlled area.

In *Figs. 5 and 6* the sowing took place at the same time, but as the growth was tall and comprised largely tea-tree, the ash was more abundant. The gorse here is almost entirely gone, and what survives is well under control and should disappear within a few months' time.

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Fig. 7.—This year's sowing with the sticks yet to be "logged up" to permit accessibility of all the young gorse to the biting teeth of the sheep.

Fig. 8.—A pasture sown in autumn, 1940, originally in a pure stand of tall gorse. The grass and clover are rapidly forming a close sward, resulting, as it does, in the complete elimination of the young gorse plants.

The Burn

The gathering of the rubbish must be completed within about six months of the burn. If all this is carried out it will be found that the gorse will not get into the spiney stage, except in odd patches. Wherever it does, it must be grubbed if it is regrowth of the old root, or cut level with the ground if it is seedling growth.

Success will not be secured from this method unless the gorse is thick and tall or mixed with a thick growth of other vegetation, such as manuka, which, when burnt, will afford a close, hot fire. Within certain limits, the hotter the fire the better the germination of the gorse seedlings. Where gorse is heaped the fire may be extremely hot and destroy the seed. The thicker the vegetation and the hotter the fire the more chance there is of killing the old plants, and the more ash the better the strike of grass and clover seed.

Fig. 9.—With gorse it can be truly said "the bigger it is the greater the fall."

The closer the gorse is cut to the ground, the greater the shock to the old gorse, and the less the foliage which can be reproduced. It is then a combat between the biting teeth of the sheep, aided by the spreading grass and clover, and the growing gorse. The old plants have only a small amount of foliage to feed their huge rooting system, and if this is constantly gnawed close to the bark, then sooner or later the plant dies. Sheep do quite well on this pasture comprising the soft leaves of the gorse and the young grass and clover.

Size of Plants

On most gorse farms the size of the plants and the thickness of the vegetation varies. Generally, there is much scattered gorse. This must be grubbed and the plants thrown in with the

Fig. 10.—A mob of hoggets on the gorse country. They do very well on the grass, clover and young gorse sward. This line were bought as culls in the autumn. Mr. Pennington states that they averaged about 7/- a head. The photograph was taken about seven months after purchase.

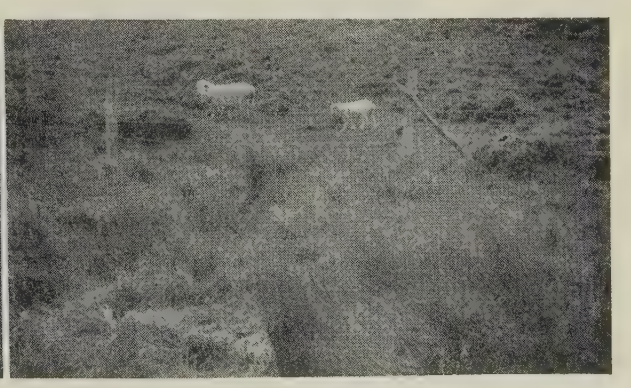

Fig. 11.—A common scene in many districts. This was taken near Waiwera. Gorse in this state is in a hopeless position to deal with. The best plan appears to be to leave a field or two at a time unstocked for three or four years and make a fresh start.

Successful Drenches

Mr. A. M. Carpenter, Southdown Stud Breeder, of Fernside, Rangiora, is a strong advocate of systematic drenching and has used Premier Products Drenches for a number of years with very satisfactory results.

GIESENS, SUTTONS and *KARTET* have on merit won wide reputation throughout Australasia as the "Big Three" drenches, each having proved highly efficient in general use. Their compounds vary, the different characteristics being, in *GIESENS* Tetrachlorethylene, in *SUTTONS* Nicotine Bluestone and in *KARTET* carbon. A combination of *GIESENS* and *SUTTONS* has proved a highly successful drench and its rapid rise to favour is strong recommendation for its use.

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gorse where the plants are closely grown and tall to increase the heat of the fire and the amount of ash. Where the gorse is thick but small, it is better left until it increases in size. It can, however, be tackled by grubbing the larger plants, cutting the smaller ones, and then burning to produce a seed bed. On such areas the control of gorse is more difficult, and hand-raking is necessary to clear away the rubbish.

This method of controlling gorse by sheep was adopted by Mr. A. Pennington, of Manurewa. The farm consists of about 120 acres, of which about 40 acres is rolling and the balance hill country, some of which is very steep. The soil, which is heavy and second class, was in bush originally. The rolling country comprised some pasture, with dense gorse and blackberry in the gullies, and much gorse and blackberry elsewhere. The hilly country comprised bush, tea-tree, and gorse—in some parts all gorse, and elsewhere mixed tea-tree and gorse, with small patches only of poor pasture and some bush. The bush has not been touched, but has been safeguarded from the burning as much as possible, and isolated trees have been protected from fire.

So successful was the method that I was informed before going on to the farm that no gorse seed germinated from the burns. This was, of course, unbelievable, and when I visited the farm I could see from the millions of gorse seedlings that abounded on the recent sowings that the gorse seed had germinated as it usually does on a burn. What appeared from the distance to be a clean, short pasture comprised gorse, clover, and grass kept short by the sheep. No doubt, some of the neighbours looking at the country from a distance thought no gorse could have germinated.

Factors in Success

To be successful in using Mr. Pennington's method, work is necessary, and by work and attention to detail this farmer has cleared the 30 to 40 acres of rolling country infested with gorse and blackberry, and I believe will soon win in a struggle against another similar area of hilly country infested with gorse. It appears most unlikely that the gorse will be the victor in the struggle, and if the gorse does win it will be because too great an area has been tackled at a time.

Scattered gorse cannot be dealt with in this way, and the thicker and taller the gorse the greater the chance of success.

When Mr. Pennington took over the gorse farm a little over three years ago he had not had much previous experience with gorse. He had, however, considerable experience on a bush farm and with blackberry. It will be noticed that he has based his operations against the gorse on experience gained in primary and secondary bush burns. He "logs up" the gorse burn by raking up the gorse sticks. On the bush burns, logs left lying about served as a shelter for much regrowth of fern and other weeds. In the same way, the gorse stick shelters the young gorse plant from the feet and teeth of stock. He grazes some cattle to tackle growth of weeds which sheep will not touch. Thus, a farm which has discouraged and beaten many occupants is well on its way to production.

Once gorse ages, it is not liked by stock, which prefer the young, tender shoots. Sheep are more fond of gorse than cattle, and are commonly used to control gorse. Generally efforts in this direction have not met with much success because the gorse has been allowed to get beyond the young succulent stage.

Success with grazing can be attained only by the concentration of sheep before the spine stage develops. To obtain this concentration, adequate fencing is of great assistance. The area to be tackled should, at least, be fenced off from other areas.

Black-leg in Calves

The number of calves vaccinated in the last financial year against black-leg in the affected areas were Taranaki 10,632, and Auckland 22,004, making a total of 32,636, states the annual report of the Director of the Livestock Division. This shows an increase of 1787 on last year's figure and would suggest that the total number of outbreaks has increased. Control by vaccination continues to give good results, and the reports for the season are very satisfactory, the actual number of outbreaks in the Auckland district being 200, compared with 222 the previous year, and the number of deaths 395, compared with 498 the previous year.

MEAL FEED FOR STOCK

Sources of Supply Discussed

SUPPLIES of meal feed for pigs are available from seconds of wheat, from the surplus of grown and imported milling wheat, from local pollard and bran, from maize grown and imported, from the surplus of grown and imported barley for malting, from the surplus of peas grown for export, from surplus meat-meal manufactured for export, and from imported pollard, bran, and molasses. A variable small quantity of meals, such as rice, copra, starch, etc., is also used, but is unimportant.

By M. J. SCOTT,
Superintendent of the Pig Industry, Wellington.

Quantities Available

The feed supplies available each year in thousands of short tons are as follows:—

Year Ending December.	Local Supplies.	Imports.	Totals.	Calculated Cost Imports per Bushel on Trucks Main Ports.
1933	184.2	7.6	191.8	—
1934	154.9	8.6	163.5	—
1935	57.5	18.2	75.7	3/9
1936	163.4	20.1	183.4	3/11¾
1937	135.4	14.4	149.8	4/8
1938	155.5	28.7	184.2	4/4¼
1939	122.7	40.7	163.4	3/9¼
1940	162.7?	34.8?	197.5?	4/0¼
1941	160.6?	35.0?	195.6?	?

Consumption

It is impossible to assess the actual annual consumption, or to say by what class of animal it is used. It is estimated that the consumption up to 1936 was between 130 and 140 thousand tons, increasing since then to 160 to 170 thousand tons annually. The four million head of poultry could use from 120 to 130 thousand tons per year at the rate of 60 to 65lb per bird. Perhaps 5000 to 10,000 tons are used by all other classes of stock except pigs, and the remaining 15,000 tons in 1933 and 30 to 40 thousand tons in 1939 are used for pigs. The pig feed supply probably comes from meat-meal, pollard, barley, maize, peas, and molasses.

A glance at the table above makes it evident that at times there is a fairly considerable carry-over from year to year, and that merchants have to make financial and storage provision for at least half a million pounds worth of feeds in some years.

Relation to Pig Production

There is a general increase in meals available, and in pig production, but the peak years of pig production—1936-37-38 and 1940—do not follow the total meals or imported meal available. It would be most satisfactory if pig production coincided with local meal production; not so satisfactory if it follows imports.

Based on the areas sown, the prospects for 1941 are that local supplies will reach approximately 160,000 tons, and that a smaller tonnage, say, 20 to 25 thousand tons of imports, will be sufficient. This estimate may be upset by weather conditions between now and harvest time.

Prices of Imports

The calculated average import price (see table) varies from £7 10s to £9 6s 8d per short ton. It is reached by taking the declared value in the country of origin and adding 1s 3½d per bushel for pre-war years and 1s 9d for 1940 to cover freight, insurance, wharfage, commission, and handling charges, etc., to F.O.R. It will be noticed that there is some relation between prices and amounts imported; an increase of 30s per ton as in 1937 reduces the import by 6000 tons, and a reduction of 23s 4d per ton in 1939 is associated with an increase of 12,000 tons of imports.

It is impossible to determine how far these calculated prices agree with prices actually charged, as they may have been masked to some extent by local prices. As stated, however, they represent a fair comparison of the average yearly prices at which im-

(*Continued on page 28.*)

SCOTCH WHISKY
"BLACK & WHITE"

It's the Scotch!

Pedigree Sow Records

Contributed by the LIVESTOCK DIVISION.

OF the 64 sows recorded for the quarter ended November 30, 1940, 46 had litters sufficiently good to be included in one of the five grades set out below:—

Grade.	Litter Weight.	
	At 3 Weeks.	At 8 Weeks.
1	120 lb.	360 lb.
2	100 lb.	300 lb.
3	90 lb.	270 lb.
4	80 lb.	240 lb.
5	70 lb.	210 lb.

THE following table sets out the performance of each breed as an average for all sows recorded during the quarter:—

Averages.

Breed.	No. of Sows.	No. of Pigs per Litter.		Litter Weight at		Weight per Piglet	
		Born.	Weaned.	3 weeks.	8 weeks.	3 weeks.	8 weeks.
Berkshire ..	21	9.4	7.7	76.4	262.2	9.9	34.2
Large Black ..	5	10.8	6.8	70.4	236.0	10.3	34.7
Large White ..	10	10.9	8.5	106.0	316.0	12.5	37.2
Tamworth ..	28	9.5	7.7	95.1	293.5	12.3	37.9

In the following list the owner's name and address are given, followed by the herd book numbers of the sire and sow, the weights at three and eight weeks, the number of pigs born and weaned, and the grade of the litter.

Berkshires.

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs		
	Sire.	Dam.	3 weeks.	8 weeks.	Born	Weaned	Grade of Litter
Burmeister, O. P., Kairanga R.D., Palmerston North ..	12859	15084	66	233	8	6	—
Ellerm, O. C., Sanson R.D., Palmerston North ..	13404	14082	54	234	8	5	—
Hastings Pig Club, c/o. R. Smith, St. George's Road, Hastings	11993	15306	99	347	10	10	—
Haumoana Pig Club, R.D., Haumoana	16140	16163	58	250	11	9	3
Kati Kati Pig Club, c/o. E. J. Whyte, Park Road, Kati Kati	14951	15596	92	330	12	10	3
McCullough, R., Patetonga R.M.D.	15432	15544	42	121	9	6	3
Manutuke Pig Club, c/o. R. K. Hepburn, Manutuke ..	13816	15329	89	225	7	7	5
Methven Pig Club, c/o. A. G. Rawlinson, Methven ..	15328	15887	72	279	12	9	5
Ngatimoti Pig Club, c/o. J. A. Brereton, Ngatimoti R.M.D., Motueka	14779	15278	84	301	10	9	4
Ohau Pig Club, c/o. W. R. B. Evans, Buller Rd., Levin	15361	13207	98	337	11	10	3
Ororu Pig Club, c/o. Tui Packard, Taipa	13405	14196	70	223	8	7	5
Parkvale Pig Club, c/o. E. T. Bliss, Parkvale, Carterton	12590	14880	102	450	10	10	2
Patetonga Pig Club, c/o. Roy McCullough, Patetonga ..	12902	14851	49	126	9	5	—
Pohangina Pig Club, c/o. T. J. Spelman, Raumai ..	14740	14589	97	324	11	7	3
Rockville Pig Club, c/o. F. W. Tyree, Rockville ..	15100	12805	94	288	12	9	3
Rushton, P., Tatuanui R.D., Morrinsville	12528	14539	70	219	6	6	5
Rushton, P., Tatuanui, R.D., Morrinsville	12528	15729	77	227	8	8	5
Swann, D., Tikitiki	13156	14794	83	263	10	7	4
Tikitiki Pig Club, c/o. J. E. Omundsen, Tikitiki ..	13156	14882	51	100	5	4	—
Watt, G., Patetonga R.D., Morrinsville	15432	14543	111	393	10	10	2
Whitechurch, F. B., P.B. Morrinsville	12528	14849	65	236	10	7	—

Large Blacks.

Dairy Flat-Silverdale Pig Club, c/o. C. C. Grut, Silverdale	1931	2277	105	378	10	8	2
Pio Pio Pig Club, c/o. G. C. Sheffield, Pio Pio ..	2061	1738	56	122	12	4	—
Rotorua Pig Club, c/o. B. Bray, Box 161, Rotorua ..	2271	2108	64	285	12	8	—
Te Poi Pig Club, c/o. G. L. Bellamy, Te Poi R.D. ..	2592	2691	69	222	13	9	—
Whitechurch, F. B., Private Bag, Morrinsville ..	1275	2247	58	173	7	5	—

Large Whites

Barrytown-Punakaiki Pig Club, c/o. A. T. Richards, Barrytown	4558	5141	95	215	14	11	5
Barrytown-Punakaiki Pig Club, c/o. A. T. Richards, Greymouth	4558	4874	79	167	11	8	—
Barter, H., Rural Delivery, Kumeu	5179	5135	91	275	8	7	3
Keiller, B. E., Box 272, Palmerston North	5203	5201	86	230	11	7	5
Keiller, B. E., Box 272, Palmerston North	5108	4999	137	365	9	9	1
Myers, N., Mauriceville West	5439	5065	156	519	14	11	1
Norsewood Pig Club, c/o. S. L. Merrick, R.D., Norsewood	5092	4860	127	487	13	11	1
Rowlands, T. E., Ruthin R.M.D., Kaiapoi	4548	4984	128	387	8	8	1
Sexton, G. D., Patetonga R.D., Morrinsville ..	5055	5379	26	93	8	3	—
Wafer, P., Barrytown, Greymouth	5155	5419	135	422	13	10	1

Tamworths.

Owner's Name and Address.	Herd Book No. of—		Litter Weight (lb.)		No. of Pigs		
	Sire.	Dam.	3 weeks.	8 weeks.	Born	Weaned	Grade of Litter
Blunt, W. H., Private Bag, Greymouth	10764	10630	88	256	8	7	4
Bombay Pig Club, c/o. N. Stuart, R.D., Paparata	11728	10094	108	363	9	8	2
Coldstream Pig Club, c/o. D. E. Smith, Waikuku R.D., Rangiora	8252	11877	111	356	10	9	2
Dalefield Pig Club, c/o. W. Press, Dalefield, Carterton	9885	10072	117	304	8	8	2
Dean, M. R., Pokeno	11942	11864	87	258	8	7	4
Dovedale Pig Club, c/o. R. J. Burnett, R.M.D., Wakefield	11969	11531	124	421	10	10	1
Geraldine Orari Pig Club, c/o. G. E. Mattinson, Winchester Road, Geraldine	10755	11312	107	278	10	10	3
Hauiti Pig Club, c/o. W. M. O'Connell, Tolaga Bay	3761	8967	33	112	5	4	—
Hohonu Pig Club, H. Beckett, Hohonu, via Kumara	10339	10121	78	225	9	9	5
Kaikoura Pig Club, c/o. F. Sharp, Box 44, Kaikoura	10502	10289	121	344	10	8	2
Karamea Pig Club, T. H. Jennings, R.M.D., Karamea	10338	10122	110	349	8	7	2
Mangatarata Pig Club, c/o. C. E. Raynes, R.D., Waitakaruru	11242	10389	140	399	10	9	1
Methven Pig Club, c/o. A. G. Rawlinson, Methven	11655	10816	109	329	8	8	2
Muff, S. R., Ohapi, Orari	10213	7466	93	255	8	8	4
Ngongotaha Pig Club, c/o. K. M. Martin, Box 13, Ngongotaha	11812	11809	48	192	12	7	—
Ohau Pig Club, c/o. W. R. B. Evans, Buller Rd., Levin	10659	9745	58	199	11	5	—
Otautau Pig Club, c/o. D. Y. Russell, Aparima, Otautau	11445	11106	107	317	9	8	2
Pokeno Pig Club, c/o. K. R. Munro, Pokeno	10921	10425	68	204	8	5	—
Riwaka Pig Club, c/o. O. C. Wilkinson, Motueka	11384	10295	82	305	11	8	4
Riwaka Pig Club, c/o. O. C. Wilkinson, Motueka	11384	10295	127	452	12	11	1
Suter, E. A., Waiau Pa	9430	9798	111	313	11	8	2
Suter, E. A., Waiau Pa	9430	10690	94	260	9	7	4
Suter, E. A., Waiau Pa	9430	9145	79	269	8	8	5
Suter, E. A., Waiau Pa	9028	11959	84	188	13	6	—
Te Arai Pig Club, c/o. H. F. Robb, Manutuke, Gisborne	11358	9911	77	218	10	5	5
Waimate Pig Club, c/o. J. C. Studholme, Te Waimate, Waimate	11544	11517	88	262	9	8	4
Wairau Pig Club, c/o. F. A. Parker, Spring Creek	7643	10296	116	370	10	8	2
Wheeler, T. A., Motukarara	11172	11119	125	425	13	11	1

Meal Feed for Stock—continued from page 26

ported feedstuffs could be placed on trucks at main ports.

Farmers may have difficulty in reconciling these prices with the prices actually paid by themselves. The average price for 1940 works out at 4s 0½d per bushel, whereas actual barley prices have varied from 3s 6d to 4s 4½d on trucks, depending on the month of purchase. The same kind of variations has been experienced in other years.

The following table shows the meal supplies available in New Zealand (short tons):—

Meal Feed Supplies Available in New Zealand (Short Tons).

Local.*	1933.	1934.	1935.	1936.	1937.	1938.	1939.	‡1940.	‡1941.
Wheat	108,665	74,804	†—18,118	75,753	46,137	79,677	47,524	86,302	76,000
Pollard	33,849	34,893	35,012	34,956	36,506	32,334	30,530	30,000	30,000
Bran	18,783	18,083	18,158	19,110	20,889	19,500	19,600	19,600	20,000
Maize	11,204	10,788	10,821	12,498	15,265	8,584	10,463	13,555	14,600
Barley	3,883	6,614	3,630	8,143	3,843	6,703	6,150	895	7,000
Peas	4,839	5,737	3,542	6,936	5,745	1,664	1,505	3,395	4,000
Meat Meal	3,000	4,000	4,500	6,000	7,000	7,000	7,000	9,000	9,000
Total Local	184,223	154,919	57,545	163,375	135,385	155,462	122,772	162,747	160,600
Imported.									
Barley	2,041	2,625	4,290	9,289	1,277	7,609	11,000	22,800	
Pollard	4,422	4,673	11,067	8,298	8,702	14,448	23,722	9,000	
Molasses	1,168	1,288	2,806	2,483	4,457	6,661	6,000	3,000	
Total Imports	7,631	8,586	18,163	20,070	14,436	28,718	40,722	34,800	35,000
Total (Local and Imports)	191,854	163,505	75,708	183,445	149,821	184,180	163,494	197,547	195,600

* Local = amounts grown less amounts used for seed, local use, exports, etc.
† Amounts of grown and imported wheat insufficient for milling purposes.
‡ Estimates for these years.

Types of Cribs for Storing Maize on the Farm

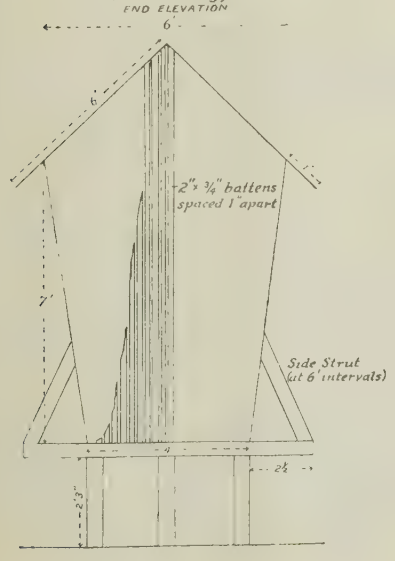
By
C. WALKER,
Instructor in Agriculture,
Thames.

In the success of a maize crop much depends on proper housing after the crop has been harvested, and the accompanying designs of maize cribs are submitted as a guide to intending maize growers, who should be able to make a selection that will meet with their requirements.

AS part of a national effort to increase primary production, farmers of northern districts have been asked to increase the maize acreage from approximately 7,000 to at at least 11,000 acres. This area has been computed as the minimum for the production of maize so that our commitments to Britain in the form of pig-meats can be fulfilled. At the present time the districts from which this increased production is expected are the Poverty Bay and Bay of Plenty areas, where maize-growing has been an established farm practice for more than half a century.

There is no reason, however, why maize growing should be restricted to those localities. Other districts, such as the North Auckland alluvial flats, parts of the Hauraki Plains, and a few favoured localities in the Waikato, are equally capable of producing excellent crops of this grain. In fact, an expansion of maize-growing in these districts alone could more than account for the extra acreage at which this country is aiming.

Maize Crib - Type 1
END ELEVATION



Factors in Success

In the growing of maize there are certain points to consider in order that the undertaking may be successful from all aspects. Firstly, one has to select suitable areas, cultivate satisfactorily, and choose a variety suited to the district. Secondly, the crop must be well inter-cultivated, and must be harvested under satisfactory conditions. Thirdly, and finally, it must be housed in a suitable building or maize crib between harvesting and shelling for market. As this period may vary from six weeks to several months, and as the crop must be protected from both weather and vermin during that period, the importance of good housing will be readily appreciated.

On existing maize-growing farms it is highly probable that suitable accommodation will be available without further expenditure, but on others, where such cropping is a departure from normal farm practice, it will be essential to determine at an early date what type of maize crib will be provided.

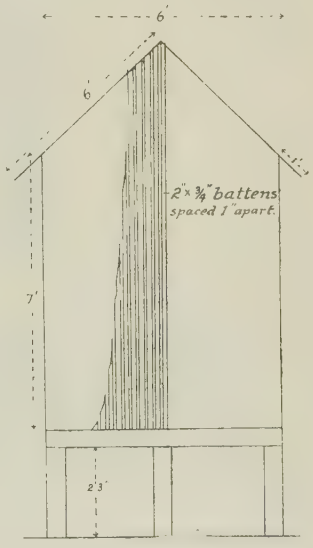
Consequently, the following designs are submitted as a guide to intending maize growers, who should be enabled to make a selection that will meet with their requirements. In the designs submitted no attempt has been made to show all timbering, but farmers will appreciate the fact that such materials as piles, floor joists, rafters, purlins, etc., will be required in such numbers and sizes as one would use in erecting any substantial farm building. More detailed plans and specifications of two of the types discussed may be obtained on application to the Department.

Requirements Of a Good Crib

Before commenting on the various designs I would like to state very briefly the requirements of a good maize crib. In the first place, it must be both weather and vermin-proof. The former can be provided by giving a fairly liberal overhang at the eaves and by building in a locality that is not exposed to the prevailing bad weather. Vermin (mainly rats and mice) may be overcome by using tin shields on piles, provided they are at least 3 ft. high, and by covering the crib with fine mesh bird netting.

In addition to the above requirements the crib must be aerated to permit the grain to dry out thoroughly without sweating. Unless this is provided for, the crop develops moulds and soon

Maize Crib - Type 2.
END ELEVATION.



rots in the crib. Aeration is provided by building the sides and floor of battens spaced at intervals. For the sides the spaces may be up to 1 in., while on the floor this may be reduced to ½ in. It is always advisable to limit filling to about 1 ft. from the top of the crib so that a good current of air can pass over the top of the maize. Occasionally, cribs are filled to the roof, but this induces sweating and will probably result in loss.

Maize cribs should never exceed 6 ft. in width, nor should they be more than 8 ft. high. They may be extended in length according to the requirements of the crop. Ventilation and aeration are very essential, and the efficiency of the crib to provide these conditions is greatly impaired where width and height extend beyond the limits given.

In parts where maize is marketed instead of being farm-consumed some importance is attached to brightness of grain. For this reason, care is taken to prevent excessive sun bleaching while the crop is in the crib, but, as this point is of little importance when considering the feeding value of the grain, it does not require any attention from the average grower.

Types of Cribs

In determining the type of crib to be employed one must first decide whether maize-growing is to be a regular practice, what area is to be grown each year, and whether such cribs can be employed for other purposes. Thus, a person who intends to crop for only one or two years will be content with a crib of Type 3 or 4; another, who intends to grow relatively small acreages as a regular practice, may prefer a more substantial crib on the lines of 1 and 2; while others, who will be growing large acreages regularly, may prefer to erect a combined implement shed and double maize crib.

Single Cribs

Type 1 single maize crib, an end elevation of which is shown, is an old type. The walls slope in from the eaves to the base, thereby providing extra protection from the weather, but causing fairly considerable stresses on the walls when the crib is filled. Consequently, struts have to be provided, as shown in the sketch. Few of this type are now built, as it is recognised that the straight-sided cribs, as shown in the sketch of Type 2, require no side struts, and they provide greater capacity. Both of these types are suitable for farms where maize-growing is likely to be a permanent activity.

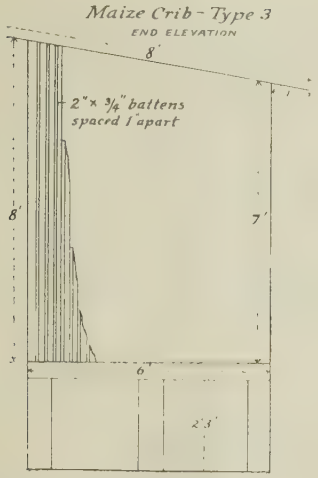
Type 3, with a lean-to roof, is also a good type of crib. It is somewhat cheaper to construct than Types 1 and 2, and is therefore suitable for a farm where regular maize-growing is practised, or where a fairly good building is required for temporary cropping.

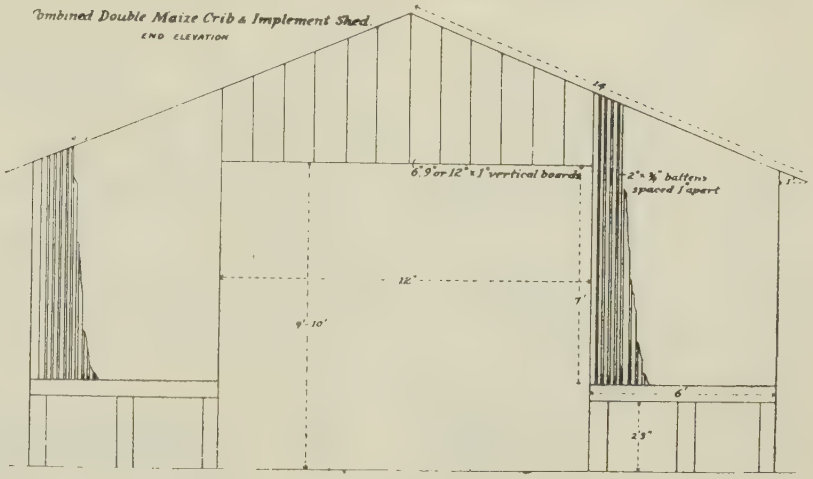
Type 4 is essentially a temporary type of crib, suitable for one or two years' cropping. The base may consist of odd limbs roughly covered by boards. The uprights may be willow, wattle, gum, or any other timber, while the whole frame is covered in netting, which should be supported by battens nailed to and between uprights to give support.

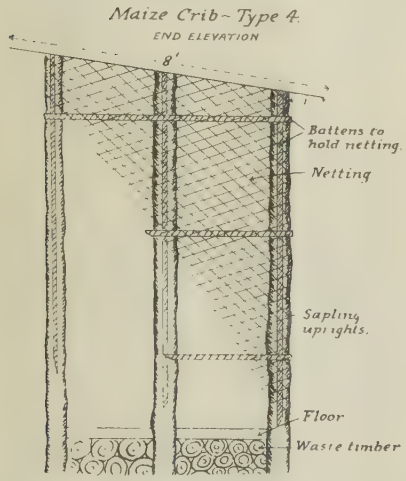
In every single crib it is desirable to place doors at both ends so that the cribs may be filled easily. In Types 1, 2, and 3 these would be built of battens, while in Type 4 it is customary to build netting on a wooden frame.

The new H.B.
SPORTS COATS
New Tweed designs in Browns, Blues, Greys, and Greens with contrasting checks—action back or plain back styles. Smartly cut; well made.

57/6
Hallensteins
29 Men's Wear Stores—from Whangarei in the North to Invercargill in the South.







To determine the size of cribs one must first know the acreage to be grown. However, this may be decided quite rapidly by allowing 6 ft. to 8 ft. of length in a crib 6 ft. wide by 7 ft. high for every acre to be grown. Yields fluctuate a great deal from district to district and according to variety, but the above guide will cover most variations.

Double Crib and Implement Shed

Where growers may have fairly large areas under crop and could benefit from the provision of an implement shed as well, the sketch showing an end elevation of such a building may be of interest. Here we have maize cribs on either side with a 12 ft. space between for the housing of implements. Ample height is also provided, but both these dimensions may be modified to suit individual requirements.

Other Uses For Cribs

Apart from the storage of maize between harvesting and shelling, a maize crib provides an excellent storage place for other materials. Bran, pollard, other grain for pig feed, and such commodities as meat-meal and stock licks can all be housed under dry conditions, and will be secure from the depredations of vermin.

Similarly, farm-grown crops, such as pumpkins and cattle marrows, may be held away from the adverse effects of weather. Tools, small implements, and a host of sundries may also be kept in such a building.

Thus, a maize crib need not outlive its usefulness once maize-growing has ceased. Rather will such a building prove to be a permanent asset which may at any time be called into use to perform its original function should a return to maize-growing be decided upon.

Which Is The Best Method Of Feeding Barley To Pigs?

By
E. H. ARNOLD,
Instructor in Agriculture,
Dargaville.

DURING the past season dairy farmers fed greatly increased amounts of barley to pigs in order to carry an increased number to baconer weight, but, unfortunately, too large a percentage of this valuable pig feed was not economically converted into bacon. A controversy arose—and, in fact, uncertainty still exists in the minds of many farmers—as to the form in which the barley should be fed so that the maximum utilisation might be obtained.

It was recommended from one source that the feeding of dry whole barley was profitable, and that it was an advantage to feed the grain in a shallow trough or broadcast it over a floor or even on a clean pasture. Other suggestions were that the grain be soaked, even until a slight beery smell was perceptible; that the grain be steeped in boiling water; that the grain be boiled until the grain burst and the mass jellified; that the barley be crushed; and that the barley be ground to a meal. Many hours of the farmers' valuable time were occupied in soaking, steeping, or boiling the barley, while often money was paid out for crushing the grain or grinding the barley into meal.

Pigs Grouped

In order to obtain some information as to which was the most practical and economical method of feeding the cheap supplies of barley available to pig-keepers, the Committee of the Northern Wairoa Experimental and Demonstration Farm Society, Dargaville, began a feed trial last autumn. Four groups of comparable pigs, each group containing four pigs, were placed under trial last April. As skim-milk supplies were rapidly declining at this time, the bulk of the ration consisted of barley; later meat-meal replaced skim-milk, and still later maize and meat-meal were fed with the barley. The only difference in the feeding and management of the four groups was in the four methods of feeding the barley.

All four groups received four feeds a day, and the barley was not given until the pigs had consumed the other food fed at that time. The dry whole barley was fed at first in a shallow trough, but as the pigs grew and consumed larger quantities it was scattered thinly over the concrete floor of the pen. In preparing the boiled barley, the barley was boiled for from one to two hours, and the boiler was then covered with sacks, and the boiled barley allowed to simmer overnight for feeding the following day. This caused the grain to burst, and by the next morning it was jellified. This was then fed in the ordinary trough, as also was the crushed barley. Barley-meal was fed as a crumbly mash, as it was found that dry barley-meal was not consumed readily by the pigs. Water was available to all pigs.

The pigs, which averaged 62lb. per pig at the start of the trial, were allowed a week to settle down to the barley feeding. The trial was then continued for twelve weeks, and the gain in liveweight per pig over this period was as follows.

	Per Pig.
Dry whole barley group ..	100.5lb.
Boiled barley group	97.0lb.
Crushed barley group	99.5lb.
Barley-meal group	110.0lb.

Results

In this trial, where barley was fed under practical farm conditions, the boiling or crushing of barley grain did not produce any better results than dry whole barley. The feeding of barley-meal resulted in an increase of 9.5lb. liveweight (approximately 10 per cent.). Here the use of barley-meal costing 4s. 9d. per pig above the cost of dry whole barley resulted in an increase of 9.5lb. liveweight—that is, 7lb. carcass worth (at 6⅜d. per lb.) 3s. 8½d., resulting in a loss of 1s. 0½d.

In this trial the cost of whole barley landed on the farm was 4s. 3d. per 50lb. If the use of barley-meal was to break even it would be necessary not to pay more than 10 per cent. of this cost to have the barley ground—that is, the use of barley-meal does not pay unless it costs less than 5d. per 50lb. to grind; or, in other words, it would be better to feed dry whole barley costing 4s. 3d. per 50lb. than to feed barley-meal costing 4s. 8d. or more per 50lb.

Slaughterings of Stock

THE following returns of slaughterings of stock at the meat-export slaughterhouses and abattoirs for the seven months, May-November, 1940, has been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat Export Slaughterhouses—						
Auckland	101,763	569,658	74,489	43,302	126,428	129,534
Poverty Bay - Hawkes Bay	42,243	56,169	118,565	52,451	242,458	11,982
Taranaki-Manawatu ..	55,102	212,083	66,937	41,223	157,811	70,142
Wairarapa-Wellington ..	26,678	29,134	57,649	29,674	93,813	15,340
Totals	225,786	867,039	317,640	166,650	620,510	226,998
Abattoirs	74,130	24,055	279,166	141,465	23,767	61,703
North Island Totals ..	299,916	891,094	596,806	308,115	644,277	288,701
South Island						
Meat Export Slaughterhouses—						
Nelson-Marlboroukh ..	1,250	9,977	26,554	12,276	51,359	4,167
Canterbury	7,061	38,961	229,170	185,650	322,661	15,809
Otago-Southland	6,439	39,384	158,117	132,425	587,845	3,809
Totals	14,750	88,322	413,841	330,351	961,865	23,785
Abattoirs	32,145	8,104	152,041	73,350	13,358	22,038
South Island Totals ..	46,895	96,426	565,882	403,701	975,223	45,823
Dominion						
Meat-expt. Slaughterhouses	240,536	955,361	731,481	497,001	1,582,375	250,783
Abattoirs	106,275	32,159	431,207	214,815	37,125	83,741
Grand Totals	346,811	987,520	1,162,688	711,816	1,619,500	334,524
Same Period, 1939— Meat Export Slaughterhouses and Abattoirs ..	293,202	977,070	942,928	482,415	1,878,819	255,131
Same Period, 1938— Meat Export Slaughterhouses and Abattoirs ..	278,337	945,963	1,046,119	585,238	1,718,591	348,384

Slaughterings of Pigs

The 81,590 pigs killed during November were distributed in weight ranges as follows:—

Under 60 lb.	135
60-110 lb.	10,595
111-120 lb.	6,149
121-160 lb.	40,365
161-180 lb.	18,931
Over 180 lb.	3,822
Sundry	1,593

The grading of pork is 91 per cent. primes and 9 per cent. second quality; and of bacon, 69 per cent., 24 per cent., and 7 per cent. of of prime 1's, prime 2's and second quality respectively.

In different weight ranges of baconers the grading is as follows:—

111-120 lb.	83%, 12%, 5% of P1, P2 and Seconds.
121-160 lb.	72%, 22%, 6% of P1, P2 and Seconds.
161-180 lb.	58%, 32%, 10% of P1, P2 and Seconds.

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Causes of Blemishes on Pig Carcasses

THERE are a number of causes of blemishes on pig carcasses, and some of these causes, particularly necrotic ulcers and weals and bruises, are discussed in this article.

(1) Necrotic Ulcers

THE accompanying photograph shows a large necrotic ulcer on the lower abdominal wall of the pig. This ulcer has resulted from a barbed-wire cut or other injury, allowing the entrance of the organism known as a spirochaete. In the early stages the ulcer is quite small, and is easily treated and cured. If neglected, it develops to the size of that shown in the picture or even larger.

A large necrotic ulcer on the skin of the lower abdominal wall of the pig.

Some pig sections are heavily contaminated with the responsible organism. In such cases it may be advisable to plough up the section, lime well, and crop. If movable, the sties may be changed to a clean area of ground. Prevention consists of the prevention of cuts and skin wounds and the application of some reliable antiseptic dressing to all accidental wounds. Drainage and liming of the pig section is recommended. The use of chlorinated lime is recommended for sties, feeding platforms, and around all troughs.

An affected pig should be isolated for treatment. Scrub the sore with a fairly stiff brush, using soap and water, to remove the thick crust and debris. When dry, dust the surface lightly with potassium antimony tartrate (tartar emetic), which is obtainable from any chemist. Tartar emetic is poisonous, and should not be used on sores about the head, as, if swallowed, it will cause death. Treat the sores when small, as large sores tend to leave a nasty puckered scar on the skin when healing has taken place.

Farmers are strongly advised to dress all sores on pigs, as the treatment is simple and easily carried out, and the results are very satisfactory. Owners should not send pigs forward for slaughter when affected with sores of this type.

(2) Detusking a Boar

The accompanying photograph shows a holding bail for a boar to enable the operation of removal of the tusks to be carried out without injury to the operator or the animal. It is made of 4 x 2 timber throughout, bolted together at the four corners, and made to fit at the outer end of the weighing race. It will be therefore, 20 inches

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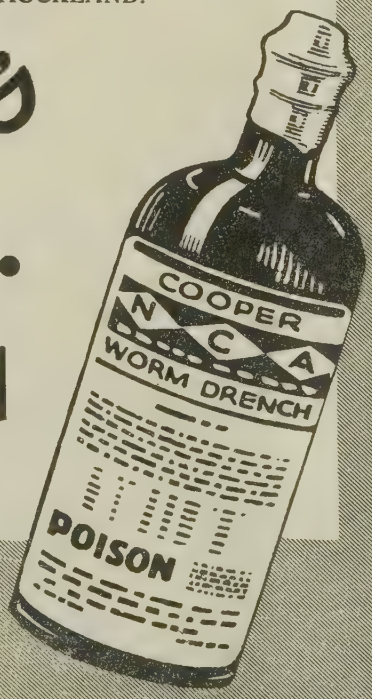
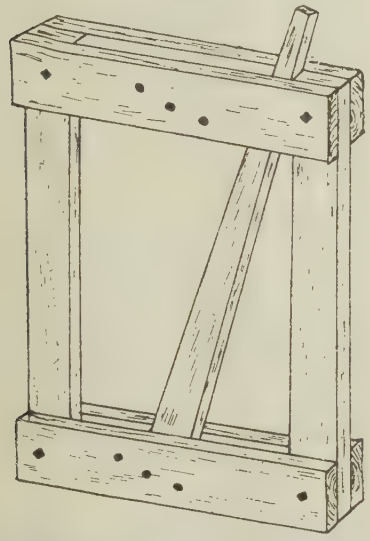


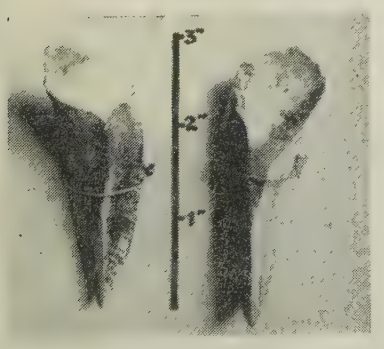
wide by 3 feet high, outside measurement. It is held in position by four loose bolts fitting through the uprights and into the posts of the race on either side.

In its absence, the boar may be restrained in a corner by means of a noose over the upper jaw as shown in Fig. 2.



A simply made detusking bail.

The boar may be restrained in a corner by means of a noose over the upper jaw.



The tusks after removal.

The tusks of a boar may be easily removed by using a sharp wood chisel, placing this right at the back of the tusk (with bevel edge down), the gum being pushed down a little if possible. One or two sharp blows with the hammer are sufficient. The whole thing is easy to do, and should not take five minutes.

The detusking of boars is of value in preventing injury to the sows in the breeding season. It prevents serious injury when two or more boars are placed in the same paddock, and it is a protection for the owners.

Fig. 3 shows the tusks after removal.

(3) Weals and Bruises

It is necessary once again to draw the attention of all people engaged in the handling of pigs to the prevalence of bruises and weals on various parts of the skin of these animals.

Bruises and the after-effects of the use of stock whips on a pig carcass.

The economic aspect of the matter should appeal to all concerned. Farmers, dealers, and carriers should do their utmost to avoid causing skin blemishes, which may bring about the degrading of pigs.

The photograph shows the marks of bruises and the after-effects of the use of stock whips. Occasionally, dog bites are also seen. Sometimes, marks about the head and neck are due to pigs fighting in the trucks. At other times, serious damage may be accidentally caused through loading a stag with other pigs.

Reference to the article on "Swine Husbandry" in the next issue of the "Journal" will show that the much hoped for decrease in weals and bruising has not taken place. In order to effect an improvement, the use of stock whips should be absolutely prohibited and greater care should be exercised in the handling of all pigs being sent forward for slaughter.

Answers to Correspondents

Severe Cough In Calves

"DAIRY FARMER" (TARANAKI):—

Some of my calves are affected with a severe cough, and are losing condition. Please inform me how the calves may be treated to get the best results.

LIVESTOCK DIVISION:—

In reply to your inquiry I am forwarding herewith this Department's bulletin on "Internal Parasites of Sheep and Calves and Their Treatment." Although the bulletin deals mainly with sheep, worm drenches for calves are also included.

The condition described by you is a typical description of calves severely affected with small thread-like worms in the bronchial tubes and small tubes in the lung. The worms may also be embedded in the lung itself. The irritation due to the worms induces coughing in an attempt to dislodge the offending parasites, and in these fits of coughing the tongue frequently protrudes from the mouth.

The treatment recommended in the bulletin deals more particularly with the eradication of the stomach and intestinal worms, as in the majority of calves affected with lung-worms the other parasites are also present.

The object, therefore, is to eradicate the bowel parasites, increase the standard of feeding, and enable the calf to throw off the lung-worm parasites. In the majority of cases this treatment proves very satisfactory, especially if a small ration of crushed oats and linseed is given daily to the calves.

Medicines given by the mouth have little or no effect on the parasites in the tubes in the lungs. If a specific treatment is required against these worms in calves, medicines may be given by an injection into the windpipe itself. This treatment is not easily carried out by the average farmer, as a special syringe and dosage are necessary and some experience of the type of calf to be dosed is necessary. Occa-

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sionally, however, a compromise is reached and farmers use a volatile agent, such as ether or chloroform, pouring about half a teaspoonful into each nostril and holding the calf so that the preparation is inhaled.

Fumigation by means of sulphur fumes is seldom resorted to in the treatment of lung worms in calves.

In the general control of parasitic trouble a change of diet and pasture is always recommended. The drier, better-drained paddocks should be selected, provided the pasture is satisfactory.

Dosing Dogs for Hydatids

C.W.H. (PANGURU):—

In your September, 1939, issue, Dr. Bennett's article on hydatids states that dogs should be dosed with arecoline tablets every three months. After several doses, is it still necessary to continue the treatment, even though they are no longer fed on offal of any kind?

I understand that although arecoline is effective with other worms besides hydatids, it is not so with all varieties that infest dogs. Would it be possible to publish an article showing the different species, how the dogs contract them, and the remedies?

LIVESTOCK DIVISION:—

The use of arecoline hydrobromide tablets is recommended for the removal and eradication of all types of tapeworms (flat-worms) from infested dogs. It is not expected that the preparation will eradicate round-worms from dogs, and other drugs are available for this purpose. It may be stated, generally, that round-worms are more likely to infest puppies and young dogs, whereas tapeworms, of which there are several varieties in the dog, may infest dogs of any age.

The main intention of the dog-dosing campaign was the eradication of the small tapeworm of the dog which gives rise to hydatid cyst formation in animals and man. In this way it was hoped to reduce the incidence of hydatid cysts in domestic animals, and also in man.

If you have conscientiously dosed the dogs several times and there is no evidence of tapeworms following dosing, it may be assumed that the dog is free from this class of parasite. Furthermore, if you can guarantee that the dogs are not fed on raw offal containing cysts and cannot gain access to any dead carcass of a sheep or other source of re-infestation, there is no object in continuing the dosing, but such freedom from re-infestation is practically impossible on a farm.

The dosing was recommended every three months to protect the human subject from dogs which might be exposed to or pick up infection from sources unknown to the owner of the dog. In this way the heavy spread of segments containing ripe eggs by infected dogs on to pastures, crops, streams, drinking water, etc., would be reduced, and, coincident with such reduction, there is a correspondingly lower risk of man becoming infected.

Summarised, it may be stated that arecoline is effective against all varieties of tapeworms in the dog, the hydatid tapeworm being the most important one. If any young dog is infested with round-worms one of the several preparations used for round-worms should be given to the dog in addition to the dosage given for tapeworms.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

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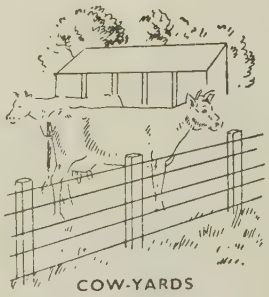

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Farm Practice and Management

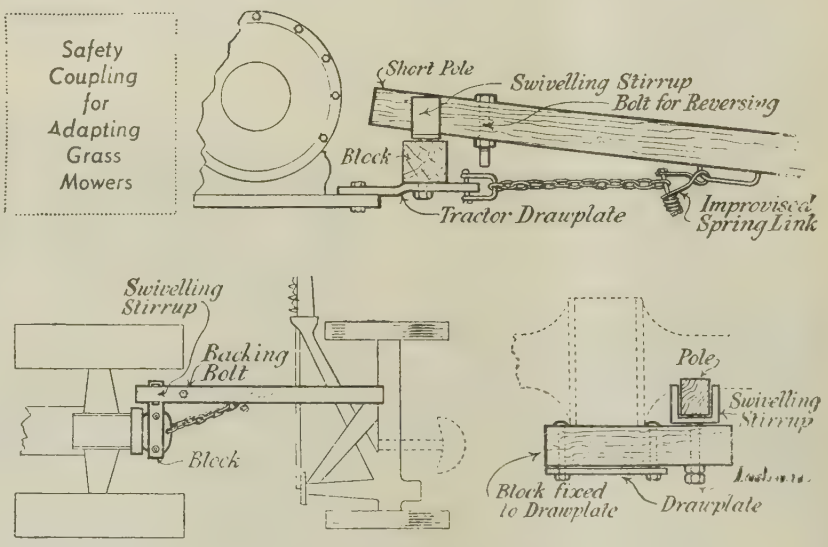
Contributed by Officers of the Fields Division

Hitching a Horse Mower to a Tractor

WITH a possible shortage of tractor mowers, farmers will be interested in this description of how an English farmer adapted his horse machine for use behind a tractor. The hitch he designed allows a wide margin of safety in tackling rough or uneven ground.

Trouble may be easily avoided, writes C. Butler in the "Farmer and Stock-Breeder," England, if attention is paid to the following points:—The forward speed of the mower should not be excessive (2½ to 2¾ m.p.h. is ample, and only machines specially designed for tractor operation should be driven faster), and the mower must be correctly hitched to the tractor with suitable safety devices.

The hitch shown in the sketch is a simple one built up on the farm, and has proved very effective with a conventional type horse-mower on a tractor.



Top.—Section side view. *Below.*—Plan showing rear tractor wheels and mower. Section.—Back view.

Attachment Described

The pole is first of all shortened somewhat. A length of about six feet is the right order to allow of short turns. It will be seen that the mower must be offset to the tractor. This is achieved by bolting a block of timber to the drawbar long enough to allow for this offset.

When this block is fixed in position the correct place for the pole can be found by lining up mower and tractor. This position for the pole is marked on the block, which is then drilled to take a ½in. or 5-8in. coachbolt. This bolt secures an iron yoke piece, in which the pole can slide easily.

The yoke can be beaten up hot from any old piece of flat iron strip and is then drilled through for the bolt. The yoke is fixed in position on the block, care being taken to see that it can turn freely. The mower pole rests in this yoke and is thus able to slide forward or backward and to pivot as the tractor turns.

The mower is hauled not by the pole, but by a short length of chain attached to the centre of the tractor drawbar and to a ring on the pole. At the end of the chain coupling to the ring a safety link is provided, and this may be bought.

The sketch shows a very effective safety coupling made from an old pair of cutting nippers. The handles were beaten flat, drilled, and a bolt passed through. A spring and two locking nuts provided a means of setting the pull at which the jaws open and the mower is released.

Bolt for Reversing

Finally, when the towing chain has been fixed and its length arranged to suit the tractor and mower, a vertical hole is drilled in the pole 6in or more behind the point where it enters the yoke piece. The correct position for this hole should be found by turning the outfit sharply right-handed and then marking the place for it so that it would be about 2in. behind the block with the pole at its furthest forward position. A long bolt ½in. or 5-8in. is passed through this hole and fixed with 2in. or 3in. projecting below the pole.

When this bolt is in position the mower may be backed at corners or when obstacles are encountered. The lifting lever can then be cranked so that it may be operated from the driver's seat, and the outfit can then be operated by one man.

The importance and usefulness of the various components should be noted. The block attached to the drawbar raises it to a suitable height for the pole and allows the necessary offset to be arranged. The swivelling yoke supports the pole and allows sharper turns to be made than would be possible if the mower were pulled through a shackle fixed at the end of the pole. Then the safety link allows the mower to drop off the tractor, the pole sliding through the yoke when an ant-hill or other obstruction is encountered. Thus, the outfit may safely be used in rough fields without fear of damage.

If a mower is used without such a device the driver must be constantly on the alert or his machine may be smashed seriously by the "relentless" advance of the tractor.

When the mower has been "lost" by the operation of the safety link the tractor is reversed up to it and re-coupled; the long bolt through the pole enables the machine to be pushed back clear of the obstruction, and the cutter-bar is lifted and lowered again when the tractor has moved forward sufficiently to make it safe to restart cutting. This reversing bolt is also of great assistance in cutting square corners.

In fact, the whole device makes an adapted mower as handy as possible.

Repairing Worn-out Tanks

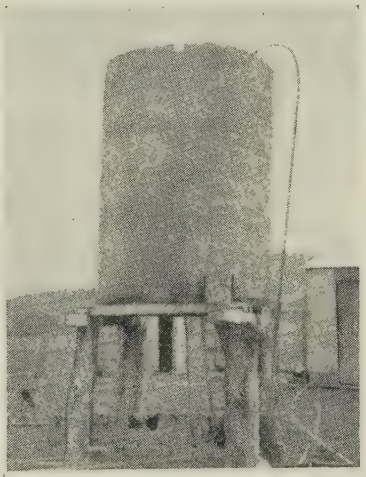
UNDER existing wartime conditions, when iron water tanks are both expensive and difficult to procure, any method which will prolong the life of a worn-out tank indefinitely and at small cost must prove of interest to many farmers.

The method as demonstrated by Mr. G. A. Anderson, of Matakana, can be successfully applied to any old tank even though it leaks like a colander and is worn in places to the thickness of paper. Provided the shell is still in one piece and is strong enough to act as a framework, it can be quite effectively repaired.

Mr. Anderson begins by filling a layer of 4:1 concrete mixture about 4 inches thick on the inside of the bottom of the tank. A length of wire netting is then wrapped tightly around the outside of the tank and the whole carefully plastered over with a coating of concrete made up of a 4:1 mixture of sand and cement, any holes in the tank being also plastered from the inside. This plaster coat need not be very thick and about 1 inch from the bottom of the corrugations is quite sufficient.

When the work has been completed and the cement has set, the tank is coated with covering of tar to prevent weeping, and if the work has been satisfactorily performed a completely watertight and highly permanent job will result.

—P. S. SYME, Instructor in Agriculture, Warkworth.



The illustration shows a 600-gallon tank repaired by Mr. Anderson. Before being mended this tank was a mere shell, and had numerous holes. Note how the corrugations of the iron can still be seen through the layer of concrete. The tank is now perfectly watertight, and has been in use for some years.

Breaking a Horse From Fence Jumping

THE other day I heard an Omokoroa farmer describing a method he had seen adopted to prevent a horse from fence jumping. Horses which have this habit are a nuisance on a farm, and often all the more common methods of breaking them of this habit are useless.

The method the farmer described was quite simple. He put a bridle and bit on the horse, and to the bit fastened a length of plough chain. He then put the horse into a paddock fenced with an electric fence on full charge. The horse jumped the fence once, but the shock he got quite broke him of his habit, and he will now always stay in the paddock in which he has been placed.

—A. V. ALLO, Instructor in Agriculture, Tauranga.

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Concrete Tracks Reduce Mud In the Stock Races

A concrete path on a Hauraki Plains farm.

UNDER wet, winter conditions stock races on the Hauraki Plains tend to cut up so badly that at times they become quite impassable.

The great majority of farmers in this locality have now overcome this difficulty by laying down concrete paths varying from 18 in. to 2 ft. in width. On some farms these paths extend right through the length of the sections and have laterals giving access to fields.

The paths are much appreciated by stock, which never deviate from them. They thereby keep much cleaner, and the reduction in poaching of the races is a decided advantage.

As an extension of this practice, some farmers propose to lay down fairly extensive concrete areas bordered on all sides by hayracks in which the stock will be winter-fed. Although the initial cost may be heavy, the consequent saving in pastures together with the provision of better conditions for stock should outweigh any objections on that score.

—C. WALKER, Instructor in Agriculture, Thames.

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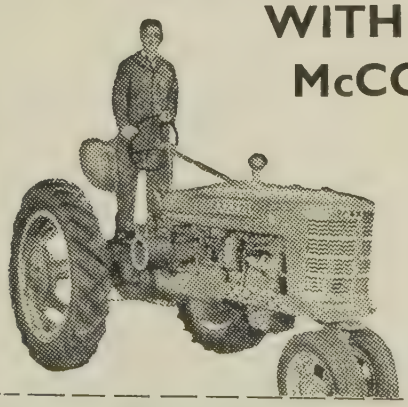

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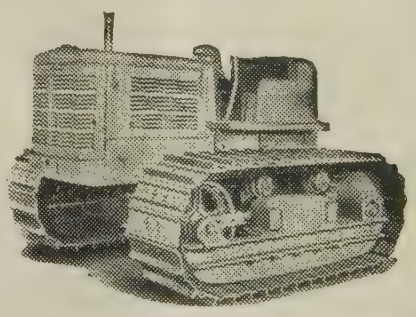

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Orchard Notes

Budding Trees for Replacements

DURING the coming months growers will be busy gathering and preparing the fruit for the market. This will no doubt be a very busy time for growers of both stone and pip fruits; nevertheless, I believe there are those who are most anxious to see improvements in the production and quality of the fruit grown. It is during the picking and harvesting period that observations should be made and any trees of outstanding capabilities noted.

There are several points of particular interest that may be noted:—

(1) Vigour and health of the tree.
(2) Habits and cropping prospects.
(3) Colour and quality of the fruit.
(4) Any other outstanding points observed.

It is only in this way that one is able to assist the industry by starting to build up lines of the most profitable types of trees.

It is realised that soil and climatic conditions affect the trees very materially; nevertheless, much can be done if some observations are made, trees marked, and particulars entered into a book kept for the purpose.

Budding

The season is now approaching for budding, and it is customary for most growers to try budding a few trees for replacements, particularly stone fruits. The work is quite simple, and the following notes may be of assistance.

First, it must be remembered that every perfect bud contains the rudiments of a tree. Buds for working must be fully developed but not ripe —that is, the shoot should not have completed its growth. The sap must be flowing in both the shoot from which the bud is taken and also the stock; otherwise it is unlikely that a satisfactory union will take place.

Fig. 1.—How the bud should be taken from the bud stick by cutting with the lay of the bud and not against it.

The time to bud is to some extent influenced by the state of the stock, but it can be practised on stone fruit almost at any time between the end of January and up to early in March.

The necessity for securing sufficient growth in the stock bars the use of the buds first formed, which are near the base of the shoot; nor is it advisable to bud too early, as the buds remain dormant until the following spring. At the time of budding the first formed buds will be too ripe, while those on the upper end will not have developed sufficiently.

The bud should therefore be taken from the middle of the shoot, which should be of medium thickness. It is important to notice the difference between a blossom bud and a wood bud. The former will not grow, but if the triple buds are taken the centre one is almost sure to be a wood bud. The shoots are taken from the tree, the upper and lower portions cut off, and the leaves removed as shown in Fig. 1. The bud sticks must be kept quite fresh, which can be done by standing them in a receptable containing a small amount of water. It is very important that the operation should be carried out quickly, as neither the bud nor the cambium of the stock should be exposed to the drying influence of the air longer than is necessary.

Fig. 1 shows how the bud should be taken from the bud stick by cutting with the lay of the bud and not against it as recommended by some.

Fig. 2 shows the method of preparing the stock and inserting the bud:—(a) T-shaped cut in the stock; (b) the bark raised ready to receive the bud; (c) the bud inserted for tying; (d) the job completed; (e) a well-developed bud.

The binding is done with raffia by laying the middle strand against the back of the stock and then bringing both ends round and across the front over the lower part of the incision. Pull both ends tightly in this place, as it tends to arrest the downward flow of sap and concentrate it about the bud. The next turn should bring the raffia across the upper part of the incision. The bud itself should not be covered, but the remainder of the incision should be covered so as to exclude the air, sun, and moisture, and the bandage should be firm but not tight.

About two or three weeks after budding it is advisable to examine the buds, and if the trees are becominng strained by the swelling of the stock run the knife through the back of the ties, but do not remove them at this stage.

A few points to observe are:—

(1) Use a very sharp knife.
(2) Select well-developed buds.
(3) Bud when the sap is flowing.
(4) Do not allow the sap on either the bud or stock to become dry or brown.
(5) The tie should receive attention a few weeks from budding.

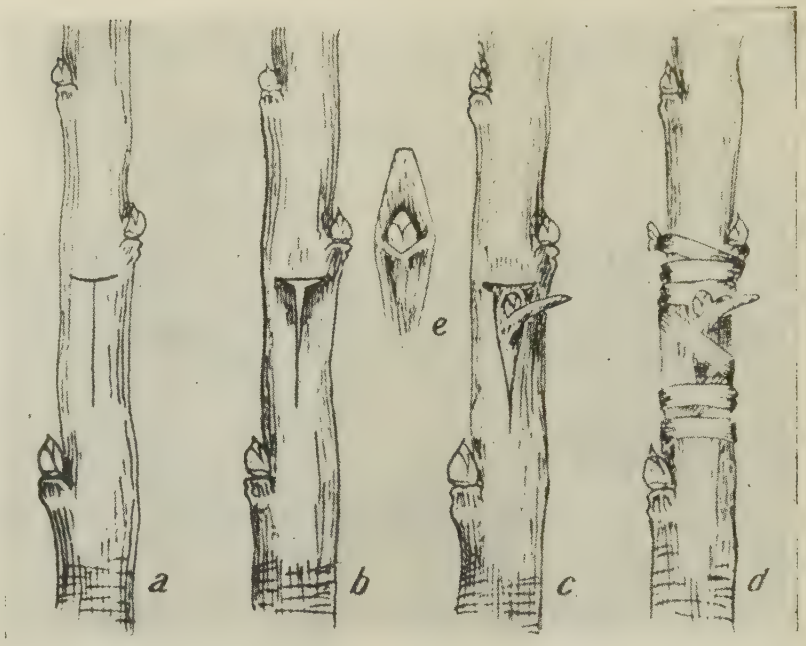

Fig. 2.—The method of preparing the stock and inserting the bud:—(a) The T-shaped cut in the stock; (b) the bark raised ready to receive the bud; (c) the bud inserted for tying; (d) the job completed; (e) a well developed bud.

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Cover Crops

In orchards where there is a deficiency of humus (organic matter) in the soil, cover crops are essential. A cover crop is used to secure its mulching and physical effect upon the land in the intervals between the regular fruit crops and the normal season of tillage. A cover crop may be valuable in two ways—by affording cover to the land, and by improving the soil when it is turned under. As a cover crop it may keep down weeds, and as a green manure it may add fibre to the soil and thus augment its holding of fertility and moisture.

Taken as a whole, the cover crop may be said to improve the soil as follows:—

(1) It protects the land and directly improves its physical condition.

(2) It prevents hard soils from cementing or puddling.

(3) It holds the rain until it has time to soak away.

(4) It dries out the soil in the spring, making early cultivation possible.

(5) It prevents erosion in the winter.

(6) It improves the condition of the soil, renders plant food available, and appropriates nitrogen if it is leguminous.

Cover crops should be sown in midsummer or early autumn after the soil has received its maximum amount of tillage throughout the early part of the season.

Spraying

Continue spraying as previously outlined, paying particular attention to codling moth, leaf roller caterpillar, *glomerella*, red mite, and brown rot.

Early autumn spraying has frequently been neglected, with disastrous results. Should weather conditions be dry, the insect pests will be most in evidence, but if damper weather is experienced usually the fungous diseases need closer watching and more attention.

—L. PAYNTER, District Supervisor, Auckland.

Mr. Smith Consults Mr. Greig About Starting a Citrus Orchard

"GOOD morning, Mr. Greig, I just called in at your office to see if you could give me a few hints on citrus growing. I've been having a look around and see a wide difference in citrus orchards. What makes all the difference and is citrus culture worth while in New Zealand?"

"Well, Mr. Smith, I'm very pleased you have called in before you started, because there is nothing that gives me greater pleasure than to see a man before he makes a start with citrus culture and it is too late to help him."

"What do you mean by that?"

"You see, citrus culture is a long-term business, and unless your original choice of soil, situation, and trees is correct, it is difficult for anyone to rectify such errors without heavy financial loss."

"Doesn't every intending citrus grower come in to see you?"

"No, unfortunately, very few people seem to realise that there are instructors available in all fruit-growing areas who give all the advice they can, free, to intending fruitgrowers. Many do not contact an instructor until they register."

"When is that?"

"When they plant their trees. Every grower who plants citrus or other fruit trees and who intends to sell the fruit, when produced, is required to register. If more than 120 trees are planted there is an orchard tax of 2/- per acre, part of which goes to the New Zealand Fruitgrowers' Federation, and part to the Department of Scientific and Industrial Research for investigation into growers' problems; under 120 trees no tax is payable."

A well planned and well managed lemon orchard owned by Mr. H. H. Booth, Te Atatu Road, Henderson.

"Have you experience in bookkeeping or been your own boss in business, Mr. Smith?"

"What strange questions to a man going on the land. Why do you ask?"

"The chief reason I ask is that citrus growing is a business and it requires accurate data kept regarding all its aspects. Also, a man requires a knowledge of how best to use his time or be his own boss. Many a man is quite a hard worker, but his energies or his finance are misdirected."

"Where is citrus grown in New Zealand, Mr. Greig?"

"From the North Cape down the east coast to Poverty Bay, with smaller areas in Hawke's Bay and Nelson."

"What is the limiting factor?"

"Frost. Even in the main citrus areas frost sometimes causes severe losses, and as frost-free an area as possible should be secured."

"What sort of soil should one select?"

"While citrus trees may be grown on many classes of soils, medium loam is

best. Lemons prefer a sandy loam and oranges a heavier and richer loam. Avoid the very light or very heavy soil."

"What about drainage or irrigation?"

"Drainage is important, Mr. Smith. Citrus trees cannot stand 'wet feet,' as they are liable to contract collar-rot. On the heavy soils tile drains are often required. Irrigation, on the other hand, hasn't been practised in New Zealand, all citrus areas being dependent on rainfall."

"Do droughts cause losses?"

"Yes, droughts on the lighter or very heavy clay soils often give citrus trees a severe setback, and I consider that an adequate water supply, available in an emergency, is a necessity."

"Can't one improve soil texture?"

"Yes, to a large extent by turning in cover crops, but don't go and pay a high price for some land and then have to make it."

"About what acreage should one purchase?"

"Between five and 10 acres, of which six should be suitable for cultivation. Limit the excess acreage to as small an area as possible, because it is generally a handicap if in scrub. There is always the fire menace, besides the work involved in clearing such land."

"How much capital will I require, Mr. Greig?"

"Between £2000 and £2500, depending upon the house you require, but you need the best part of £2000 available to draw upon."

"But don't citrus trees begin to bear at five years of age?"

"Yes, in general, that is true, Mr. Smith, but there is a vast difference between beginning to bear and becoming payable. Too many growers have believed their worries are over when their trees reach five years. Do you know that the next seven years are the most difficult in a citrus grower's orchard life? The original capital is just a small fraction of the capital invested in the property at 12 years of age. Annual maintenance for rates, manures, cover crops, spray materials, and cultivation build up the capital invested per tree before the trees begin to bear, and then over the next seven years returns only gradually overhaul maintenance as the trees begin to bear."

"What do you call a full-bearing tree?"

"In working out costs of production we have adopted a standard of 5½ loose bushels for lemons, and I think probably five loose bushels of sweet oranges or New Zealand grapefruit per tree could be considered as a reasonable standard for mature trees. Trees generally need 12 years to reach this cropping capacity. The cropping capacity of an orchard over a period of three to five years can generally be regarded as a fair indication of the value of an orchard."

"What are the jobs citrus growers will be doing if I go around this next month?"

"Keeping ground in good tilth, purchasing seed and manure for autumn dressings, and applying their first summer oil spray—certified brands at 3 per cent. for the control of red-scale or with the addition of nicotine sulphate 1-800 if thrips have been troublesome."

"Well, thank you very much Mr. Greig. I'll have a look around and call in again. Good-bye for the present."

—A. M. W. GREIG, Citriculturist, Auckland.

Viticulture

Points in Making Cider

THE sugars in the juice of ripe apples comprise sucrose (cane sugar), dextrose, and laevulose. Laevulose, however, is the largest constituent. The sucrose represents about 5 to 39 per cent. of the total sugars, and in the remainder, the proportion of laevulose to dextrose ranges from 10 to 1 down to about 3 to 1. In the progress of fermentation the cane-sugar becomes inverted, and the original dextrose may be fermented out completely, leaving only laevulose and more or less inverted sugar, or perhaps laevulose only.

Important Constituents

The important constituents of cider "must," other than the sugars and the small quantities of esters or essential oils to which the characteristic apple flavour is due, are the acids, pectins, and tannins. According to a table drawn up by the French "Association Pomologique," the must from 11 different varieties of apples recommended for the making of cider yielded the following data:—

Sp. gr.	1.050 to 1.133		
Total sugars ..	9.3 to 26.3	grams per 100 c.c.	
Acid as Malic)	0.015 to 0.970	,,	,,
Tannin	0 008 to 1.085	,,	,,
Pectic substances	0.01 to 2.10		

Some English cider-musts analysed by A. H. Allen gave the following results:—

Sp. gr.	1.047 to 1.055
Solids, per cent.	11.91 to 14.63
Glucose	8.82 to 13.51
Sucrose	0.38 to 1.34
Fixed acid (as malic), per cent.	0.28 to 0.50
Ash, per cent.	0.22 to 0.35
Tannin, per cent.	0.22

These samples were analysed about 36 hours after the juice had been pressed, and contained a little alcohol, ranging up to 1.13 per cent. The "glucose" represents the whole of the reducing sugars present, including any inverted sucrose.

In a report upon the results of investigations into cider-making carried out on behalf of the Bath and West and Southern Counties Society, F. J. Lloyd gives the composition of the juice from a large number of varieties of apples grown in England. The juice from the variety known as "Kingston Black" gave the following results:—

Sp. gr.	1.050 to 1.069		
Solids	11.34 to 17.30	per cent.	
Grape sugar (glucose)	9.58 to 15.06	,,	
Cane sugar (sucrose) ..	0.60 to 5.12	,,	
Malic acid	0.29 to 0.64	,,	
Tannin	0.10 to 0.18	,,	
Extractives	0.16 to 1.90	,,	

The results represent apples of the variety in question grown over 10 different years.

Good cider can be produced from apples and blends of apples containing very different proportions of sugar, acid, and tannin, and, with the exception of the saccharine contents of the apple juice, these ingredients are not found in the same proportions or in known equivalents in the finished cider. It is evident from these considerations that personal taste plays a large part in the selection of suitable apples for blending, and the following approximate composition of the juice of a suitable blend should only be taken as a general guide:—Density, 6 to 8.5 Baume (1.043 to 1.063 specific gravity); total acidity as malic acid, 0.4 to 0.6 per cent.; tannin, 0.2 to 0.4 per cent.

Best Criterion

The best criterion on which to base the choice of apples, and the proper proportions of the different varieties to be used for blending purposes is furnished by the cider produced from them. It is therefore essential in order to arrive at manufacturing a standard article to take note when preparing the apples for the mill of the names and quantity of each variety and their respective qualities, the nature of the soil and situation in which they were grown, and of all other factors which, in the cider-maker's opinion, are susceptible of modifying the finished product. By comparing the finished ciders the maker can ultimately select a suitable blend of fruit for the manufacture of a high-class cider of distinctive qualities, acceptable to connoisseurs and the majority of consumers. Only those varieties which attain their maximum sugar content at the same period should be blended.

Because of the difference in climatic conditions the constituents of the same varieties of apples grown on the same soil may vary considerably from one season to another, and the same varieties of apples produce qualities of cider varying with the composition and aspect of the soil the apples were grown on. The following analysis will show this point. The variety of apple was Jonathan, and the fruit was taken from the same tree each year at full maturity.

	1938.	1939.	1940.
Sugar	10.3	5.96	7.83
Acids	0.64	0.39	0.25
Water	87.05	82.00	81.04
Extractives	2.28	11.65	10.88

The same care has to be observed as to the correct time of processing the fruit. The following analysis shows the importance of this point, all apples for this test being taken from the one tree:—

	Green.	Ripe.	Over-ripe.
Water	85	82.8	63.5
Sugar	5.4	11.4	7.6
Acids	.49	.50	0.6
Extractives ..	9.11	5.3	4.3

Milling and Pressing

The object of grinding or milling the apples is to rupture the cells containing the juice so that the maximum of juice can be extracted when the pomace is placed under pressure. Small quantities of apples can be mashed in a tub and the pomace placed loosely in a previously boiled, clean onion-bag, which can either be twisted or placed between two boards and pressed with an improvised lever to extract the juice. Such methods, of course, cannot be considered when it is intended to produce cider on a commercial scale, although for the production of a few barrels the lever principle can be applied by fixing an iron or wooden bar in a hole cut in a tree or in a wall, with the fulcrum placed on the cheese built up of pomace, and the long arm of the lever weighted with a sack of earth or other convenient weight.

A press made on this principle should cost very little, and has an advantage over a screw-press in that it keeps up a continual pressure as the juice escapes and the pomace sinks. Very convenient and compact small, hand-operated cider-mills are made, combined with small screw-presses. These are very suitable for producing two or three barrels of juice per day. Larger power-mills and presses, both screw and hydraulic, suitable for factory work are made, capable of extracting from 10 to 300 barrels of juice per day.

Presses Described

Most of the large commercial cider-makers in England and France use the grater type of mill. These are

Fig. 1.—The form viewed from above.

made with a wooden or metal cylinder fitted with corrugated or saw-like blades, which grate or rasp the apples against a metal concave shoe, so regulated that the apples are reduced to a finely divided pomace without crushing the pips, which would give an undesirable flavour to the cider.

The old method of building up the cheeses with straw or rushes is seldom employed at the present day. The modern method of building up a cheese consists in placing a rack made of wooden laths or basketwork on the bed of the press, or on the bed of a truck on which the cheese is built up

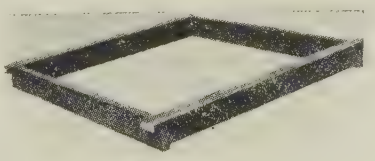


Fig. 2.—The form viewed from the side.

under the mill and run on rails to the press when completed. A square form, 3 in. or 4 in. deep, is placed on the rack, and on this a stout, open cloth made of cotton or some other strong fibrous material is laid diagonally over the form, allowing the cor-

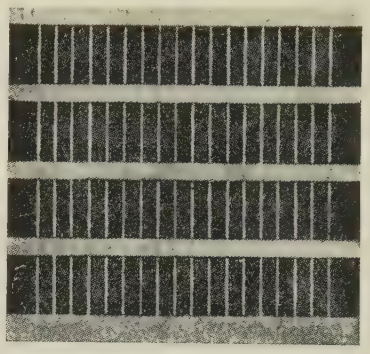


Fig. 3.—A single rack.

ners to fall over the sides and ends. The pomace is then run into the form. If falling direct from the mill, it is liable to pack hard, and should be moved away from the centre to the corners, which should be well filled in.

The finished layer of pomace should be quite level. The corners of the cloth are now folded over the pomace (not too tight), the form raised, and

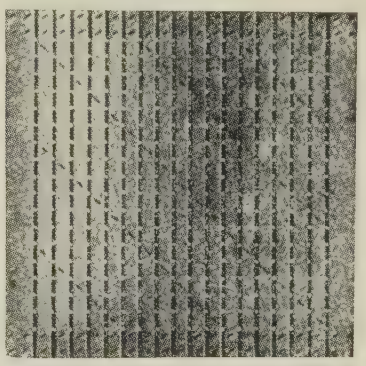


Fig. 4.—A double rack.

another rack placed on the layer just completed. On this rack the form is placed and the operation repeated until the cheese is made up. If the cloths are drawn over the cheese too tightly unnecessary strain is placed on the cloths at the edge of the cheese, which will cause them to burst. Care in laying-up the cheese will make it press straight, will prevent injury to the cloths and racks, will make them last longer, and will give a larger yield of juice.

—*B. W. LINDEMAN, Vine and Wine Instructor, Auckland.*

Cool Storage Notes

Preparing for the Coming Season

EVERY care should be taken to ensure that pears intended for storage reach the cool store within 36 hours of picking, and that the temperature is rapidly reduced to 330 degrees Fahrenheit.

During the 1939 fruit season a trial was conducted to determine the difference in the time necessary to reduce the temperature of unwrapped pears and fruit that had been wrapped and packed. The average time taken to reduce the temperature of fruit unwrapped in cases from 70 degrees to 32 degrees Fahrenheit was 72 hours, as against the average of 108 hours for the wrapped, packed fruit.

When pears have been received at the cool store a more rapid rate of cooling will result if there is sufficient space available in the cool chamber to enable the cases to be spread out on the floor for 24 hours or longer before they are placed in stacks.

The best method of dealing with pears for export or for long storage is to pick the fruit into orchard boxes and immediately place the boxes in cool storage unlidded. This procedure overcomes the delays which occur when pears are sized and packed before storage, and facilitates rapid cooling. Under the present emergency conditions it may be found practical to consider the cooling of pears before packing in districts where the cool stores are situated near the orchards. If this could be carried out pears could be packed at the cool store after the apple crop has been harvested, and thus spread the packing over a longer period.

Under the present emergency conditions the owners of refrigerated premises are required to notify the Primary Industries Controller, P.O. Box 3004, Wellington, C1, before making any addition to their cool storage accommodation.

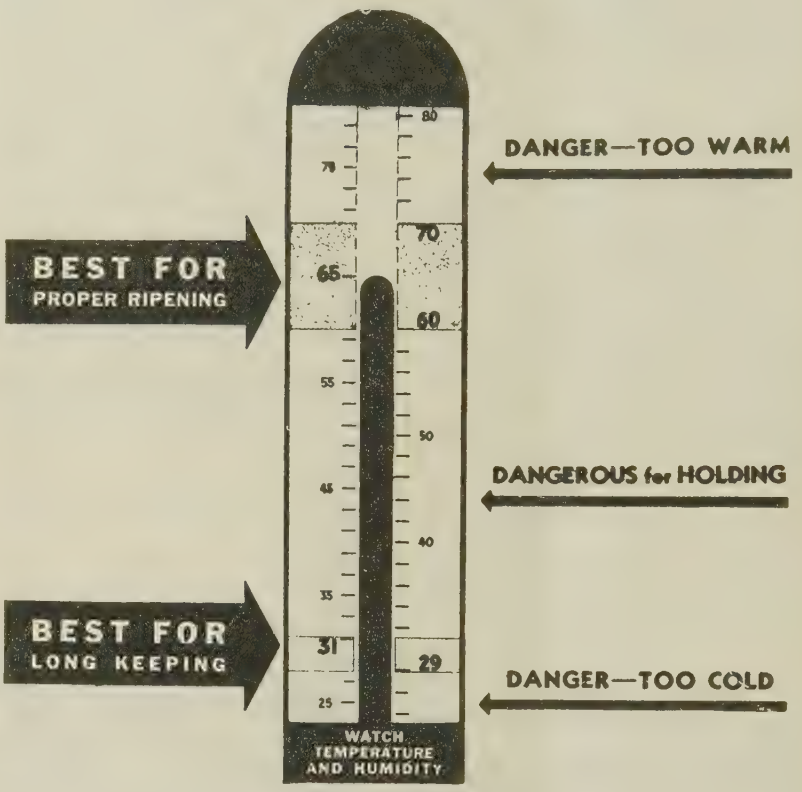
All the refrigerating plant and equipment should be thoroughly overhauled, including any weakness in the insulation material or timber construction of the building, to ensure that all will be in good running order for the coming fruit season. The chamber doors and ports should also be thoroughly examined in order to find and repair any faults which may cause a loss of efficiency due to faults in the material forming the seal.

—A. POWELL, Cool Storage Officer, Wellington.

Pear Temperature Chart

Plenty of moisture in chambers where pears are stored or ripened will prevent wilting.

Note: To preserve the natural bloom of pears 85-90 per cent. relative humidity is beneficial.



Important Points for Long Storage

(1) Place Pears in cool storage immediately when picked.

(2) Stack Pears to permit air circulation around boxes.

(3) Store Pears by themselves as Pears require to be held at lower temperatures than other fruits.

(4) When wrapped and packed before cool storage Pears take longer to cool.

When pears have been placed in cool storage at the correct state of maturity for long holding, one of the improvements that would increase the consumption of this fruit would be to establish facilities for the ripening of pears after cool storage and before marketing. Pears should not be marketed in a hard, green condition, as they are removed from cool storage, but should receive special temperature and humidity treatment similar to that required for ripening bananas before offering them for sale.

These recommendations, if carried out, will maintain pears in good sound condition to supply the full requirements of the markets of the Dominion throughout the year, and wastage and financial loss will be overcome.

—Adapted from "The Blue Anchor," California Fruit Exchange.

The Home Garden

Vegetables, Small Fruits and Flowers

Manuring of Lawns

THE lawn sward differs from the agricultural sward in three main respects. Firstly, it is maintained in short condition by constant mowing, with the result that light penetrates deeply into the sward, a condition which is favourable to the development of weeds (and clovers). Secondly, the removal of so much of the growth in the form of clippings reduces the fertility of the ground, with the resultant opening up of the sward, again favouring the invasion by weeds. Thirdly, with the absence of clovers in the better lawn swards there is no fixation of atmospheric nitrogen, with the result that the nitrogen requirements of the grass must be made good from nitrogenous manures applied. It is therefore not surprising that lawns require a special manurial technique.

Acidity of Soil

The vigour of the grass species should be maintained and increased by manurial application so that the ground is completely covered by a dense sward. As lawn grasses will tolerate acid conditions to a greater extent than weeds and clovers, a manurial programme which will increase the acidity of the soil will make for a purer grass sward.

Such a soil condition may be obtained by the use of the acid-forming manures—sulphate of ammonia and sulphate of iron. Phosphate is required, and superphosphate is the most suitable source of this essential plant food. Its use without sulphate of ammonia encourages a strong development of the clovers, and where these can be tolerated superphosphate straight is a satisfactory manure to use. On certain soils, especially the lighter soils where a response for potash is shown, this should be added to the mixture at the rate of ½ oz. to the sq. yard.

Lime is seldom required as a lawn dressing. It neutralises acidity and increases weeds, and should be used only at three- to four-year intervals if the lawn fails to respond to the artificial fertilisers applied.

To maintain a thriving grass sward in the absence of clovers large amounts of nitrogen are required. This should be rationed to the plants, for when it is given in large amounts it is absorbed rapidly, producing a great flush of growth followed by a long period when the amount of growth declines. In addition, large doses cause a serious temporary burning of the plants. These two disadvantages are largely eliminated in the seasonal programme suggested below. Where the lawn contains few or no weeds the amount of sulphate of ammonia may be reduced and the balance of the nitrogen supplied to the advantage of the lawn in dried blood.

Distribution of Fertilisers

It is imperative that the quick-acting fertilisers used should be evenly spread over the whole of the lawn. To effect this even distribution, the amounts of the fertilisers required for the whole lawn should be weighed out. The lawn should then be marked into a number of similar sized areas, and the manure similarly divided into a number of lots, one for each area. The manure should then be mixed, any lumps broken up, and then mixed thoroughly with a large quantity of dry soil or sand to facilitate distribution.

The various lots of manure and soil should then be distributed over the previously marked areas. An even spread is ensured when the area is gone over in different directions, handfuls of the soil and manure being broadcast from the operator so that the material falls evenly. This operation should be continued until each lot of mixture is distributed over its respective allotment.

Applications To Make

In this seasonal programme the amounts of fertiliser to apply are given in ounces to the square yard.

—F. SYDENHAM, Assistant Horticulturist (on Active Service).

Seasonal Don'ts

Don't

cultivate the soil between rows of crops too deeply at this season of the year. Deep cultivation when the ground is dry has two serious effects on crops. Firstly, it may injure the rooting system which as the crop develops, penetrates throughout the greater portion of the soil. Secondly, it stirs a considerable depth of soil and exposes a greater amount of it to the drying influence of wind and sun and aggravates drought conditions. But—

Don't

neglect light surface cultivation. If the top inch of soil is maintained in loose condition the water in the lower layers is conserved and the plants are given the best possible conditions for their development.

Time of Application.	Weedy Lawn.		Clean Lawn.	
Autumn	Superphosphate	1 oz.	Superphosphate	1 oz.
	Sulphate of ammonia	1½ oz.	Dried blood	1 oz.
	Sulphate of iron	½ oz.	Sulphate of Ammonia	½ oz.
Spring	Sulphate of ammonia	1½ oz.	Dried blood	1 oz.
	Sulphate of iron	½ oz	Sulphate of Ammonia	½ oz.

What To Do In The Garden Next Month

Summary of Operations During February

VEGETABLE SECTION.

SUCCESSIONAL SOWINGS.

Peas (early dwarfs), lettuce (grow without transplanting), radish, spring onion (water well), and turnips.

OTHER SOWINGS.

For Winter Use.—Endive, lettuce, spinach.

For Spring Use.—Carrots (short-horns), spring cabbage and cauliflower.

Seedlings to Transplant.—Nil.

SPECIAL NOTES FOR WARM DISTRICTS.

Sow dwarf beans till middle of month, and globe beet for winter use.

CROPS IN SEASON.

(The month in brackets represents the month of sowing the seed).

Salads.—Lettuce (Nov.), radish (Jan.), corn (Nov.), tomatoes (Aug.), cucumbers (Sept.), celery (July), spring onions (Nov.).

Greens.—Beans (Oct.-Nov.), marrows (Oct.), peas (succession of main-crop), New Zealand spinach (Oct.).

Roots.—Beetroot (Sept.), carrots (main-crop and Nov. short-horns), parsnips (Sept.), potatoes (main-crop), onions (Mar. and July-Aug.), pumpkin (Oct.), salsify (Oct.), turnips (Dec.).

CROPS IN STORE.

Kumaras (if suitably stored), shallots, potato onions.

GENERAL WORK.

Keep the hoe moving to control weeds and to conserve moisture.

Apply liquid manure to salad crops and water to newly-planted crops.

Thin out seedlings as they become large enough to handle.

Spray to prevent disease, and use derris dust to control white butterfly.

Plant a cover crop on ground that is vacant and not required for cropping. If this ground is infested with twitch, cultivate it freely and fork out as many rhizones as possible.

Lift kumara runners.

Tie up and prune tomato vines.

Keep celery and celeriac moist.

Use water judiciously (see paragraph on page 455 in last month's "Journal").

SMALL FRUITS SECTION.

The ground in plantations when the fruit has been harvested, and the necessary summer pruning done, should be cleaned up and a green manuring crop sown with a light dressing of superphosphate.

Areas for new planting should be cultivated and sown down to a green manuring crop to be worked under four to six weeks before planting.

Strawberries.—Suppress runners on beds that remain down for several years. A generous watering in a dry season frequently improves production and assists the development of a late crop.

Raspberries, Loganberries, etc.—Spray with Bordeaux (3-4-50) to control leaf-spot and cane-wilt, and include arsenate of lead (2lb./100 gallons spray or 1 oz. to 3 gallons) to control bud-moth.

GLASSHOUSE SECTION.

See last month's notes.

Answers to Correspondents

Splitting of Carrots

W.H.S. (BLENHEIM):—

I would like some information regarding carrots and walnut trees.

Last season about one carrot in two split down the side. The split gradually opened until some of them, instead of being round, were only about a semi-circle in shape. Could you please tell me what might cause the trouble and what would prevent it?

The leaves of the walnut tree appear to have some blight which seems to give the leaves the appearance of having been blistered. Also, the fruit seems to form all right, and then a black spot appears and gradually expands, covering the fruit. When the fruit is examined closely the outer casing, which should be thick and green, is found to be black and shrivelled until it is only as thick as cardboard. Will you please supply the correct treatment for walnut trees? Should they be pruned and sprayed? If so, how and with what? Also, should the bark of the tree be cut about?

HORTICULTURE DIVISION:—

The splitting of carrots occurs when the ground is very fertile and wet weather is experienced in summer and autumn. The growing portion of the carrot then enlarges rapidly, and the surface, if it is not able to increase fast enough, splits. Once this occurs the rupture gradually extends. The trouble occurs chiefly when the roots are left in the ground after reaching maturity, and more especially when the weather is warm. The roots should be used up before reaching that stage, or, if they do reach it, they should be lifted and kept in a cool shed.

The blisters occasionally found on walnut leaves are caused by a gall insect; it is of no economic importance. The black discoloration of the fruit is due to a bacterium, *Phytomonas juglandis*, more commonly known as "walnut blight." The early-flowering seedlings are most subject to the trouble, and that chiefly during a wet spring season. It is not customary here to apply treatment for this trouble, but reports from Oregon in the United States inform us that "where frequent prolonged rains occur during the critical period of infection three applications of Bordeaux mixture, in the early pre-blossom stage, late pre-blossom stage, and immediately after blossoming, reduced infection to an insignificant amount." The strength of the Bordeaux mixture was 2-2-50—2lb. each of bluestone and burnt lime and 50 gallons of water.

Longitudinal incisions are sometimes made in the bark of walnut trees. After a period of stunted growth this treatment releases the grip of the hardened bark and permits normal annual expansion. Little pruning is usually required, and that chiefly when the tree is young to keep it balanced and shapely, and avoid congested growth in any part. Your district Orchard Instructor will be pleased to tell you more about this.

APIARY NOTES

Contributed by Officers of the Horticulture Division

Problems in Honey Packing

Straining

As indicated in last month's notes, warm temperatures may render the honey sufficiently mobile to allow all impurities to rise to the surface, but normally it is necessary to strain all honey before packing. Bee-keepers are advised to conform to the English standard of cleanliness, which requires honey to be as free from foreign matter as honey strained through a standard bolting cloth of 54 meshes per linear inch. There must also be no surface scum or dirt. Where bee-keepers are unable to secure materials for making suitable strainers of a permanent nature, cheese-cloth will do.

Honey which has been strained through a double thickness of ordinary fine cheese-cloth without pressure of any kind at ordinary extracting room temperatures and which has been allowed to stand for a short time in settling tanks will usually be practically free from foreign material.

Bulk Supplies

All honey packed in bulk containers for dispatch to the grade stores must also conform to the following standards. The honey, when liquid and clear, shall have a specific gravity of not less than 1.420 at 60deg F., and contain not less than 80 per cent. of total solids and not more than 2.5 per cent. of sucrose. It shall be well ripened and free from objectionable aromas and flavours due to overheating, fermentation, smoke, carbolic acid, and natural taints.

Unevenness of Pack

Unevenness of pack is a source of trouble to many bee-keepers who reside in districts where a variety of honeys is produced. Bee-keepers very often pack a series of small lines with the mistaken idea that they will receive a greater return if a few cases of slightly better grade are dealt with separately. The separation of a crop of honey in this manner gives the bee-keeper a great deal of extra work, and also has the same effect at the grade store. A series of small lines of slightly different quality is not desirable for ordinary trade purposes, and repacking into standard packages is made more difficult.

Nectar Supply

In many districts throughout New Zealand a variety of honey plants is worked by the bees; consequently, a variety of grades of honey is stored in the hives in the order of supply. This continues until the main honey flow begins, and the hive by this time has built up to three storeys and may partly occupy the fourth. The main honey flow is usually gathered from one source; therefore, the fourth super and any above will be filled with honey even in colour and flavour in any given locality to the end of January each year, with the exception of low country, where Pennyroyal yields heavily in some seasons.

Removal of Honey

Allowing for the variation in grades of honey gathered at different apiaries, evenness of pack can be secured by taking the supers from the hives singly until a complete round has been made, and extracting each set of combs from any one apiary in one lot. To secure evenness of quality in a series of tanks for the purpose of packing large lines, it is necessary to arrange stacks of full supers in the order they are taken from the hives, but instead of extracting each stack separately take one super from each until a complete round is made, and follow through in this manner until the whole has been dealt with.

This method applies more to large bee-keepers, and allows the installation of large tanks. It also simplifies handling and packing and provides large straight lines of honey so desirable for all trade purposes.

A variation of flavour and colour cannot be avoided where the hives have been stripped down to the brood chamber at one operation and the honey extracted over a period of days without regard to the order of extracting the honey from the combs.

The above system of packing is desirable in all districts where clover and mixed sources are available. In districts where two or more distinct grades are produced, contrasting greatly in flavour and colour, it is desirable to extract and pack each grade separately as near as it is possible to do so for all grade store consignments.

Trouble will be experienced if warm honey is run into a tank partly filled with cold honey. The cold portion will close over portions of the warm honey and prevent the clearance of air bubbles and impurities. It is also difficult to secure a good blend under these conditions.

Manuka Honey

It is extremely difficult to find suitable markets for manuka honey away from the areas in which it is produced owing to its general condition and its thixotropic nature. This condition makes it impossible to extract manuka honey from the combs by ordinary methods, and when it is separated from the combs it will not strain and holds suspended all air bubbles and foreign matter.

To be removed from the combs by centrifugal force, manuka honey must first be stirred up or agitated. This is done by the use of a pricker pad, which temporarily breaks up or softens the stiff, jelly-like condition sufficiently to enable it to leave the combs freely, but not sufficiently to enable the clearance of foreign matter and air bubbles that enter the honey during extracting operations.

Moderate heating will not reduce the viscosity or holding condition sufficiently for clarification either by

(Continued on page 60.)

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Internal Parasites in Poultry

MORTALITY and sickness among poultry of all ages due to internal parasites, such as worms, is becoming distressingly common, and greater attention will have to be paid by poultry-keepers to guard against future losses. It would be safe to assume that these parasites infest almost every flock of poultry in the Dominion to a greater or lesser degree, and are more responsible for unthrifty flocks and low egg yields than any other cause.

The danger from a reduction of a bird's vitality and resistance to disease cannot be too strongly emphasised, as there are many troubles among poultry resulting from heavy parasitic infestation. With the introduction of modern methods of keeping larger numbers of birds on limited areas, the chances of these parasites making their appearance in the flock cannot be too seriously considered.

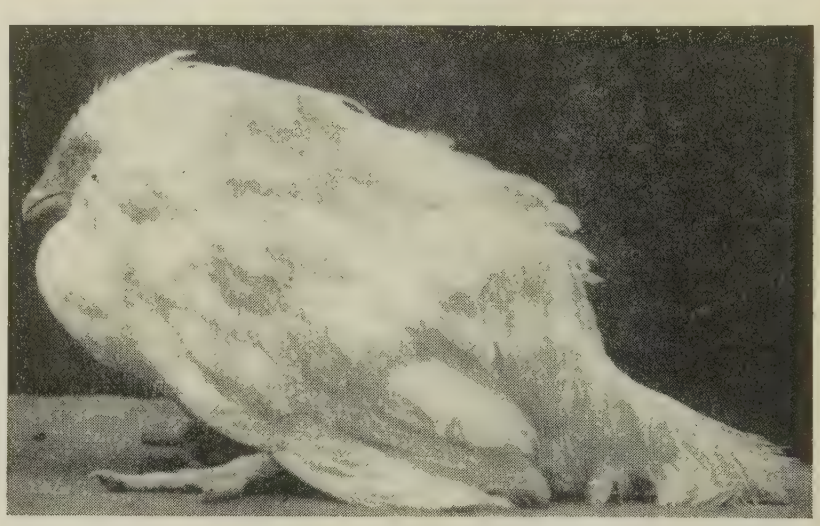


Fig. 1.—**Acute parasitic infection in a growing pullet.**
[*A. L. Bryant, photo.*

Importance of Cleanliness

The only sound method of dealing with troubles in poultry is to prevent them, and the first essential is to breed and rear stock with strong constitutional vigour and resistance to sickness and disease. Good stock properly housed and well fed is, in general, the most important factor in profitable poultry-keeping, but no matter how good the stock, the housing, or the feeding, the best results will never be obtained unless the poultry-keeper realises the importance of cleanliness. Neglect in this item means that parasitic life is sure to appear sooner or later among the flock. Birds will become affected even on well-managed farms, but under proper conditions such flocks can be easily controlled.

It is always found that the less sanitary the houses and pens, the quicker will parasites make an appearance and the more rapidly will they spread. It is therefore essential to pay strict attention to cleanliness in all things pertaining to the farm, including the feed and water, utensils, houses, and pens. If the ground on which the birds run is allowed to become stale, it will soon become a breeding place for parasites. There is little doubt that fouled ground is the greatest factor in spreading intestinal worms, particularly with young growing stock.

Double runs are always advisable so that the ground can be rested and put under cultivation if necessary. Top-dressing the ground heavily with lime and planting the runs with oats and grass, millet, and rape, etc., are good methods of cleaning the soil of infection, and they also provide a good supply of greenfood and fresh runs for later use. At all times guard against the birds coming in contact with damp ground; dampness on the floors of the houses near the drinking places is always a breeding ground for parasitic life, and this should be prevented.

Shady places in runs where the soil remains damp should always be avoided, as they retain worm eggs for long periods; this is very important on ground where young chickens are being reared. Strict attention to hygiene, the avoidance of overcrowding, and the provision of clean ground for the rearing of young stock will always assist in controlling parasitic infestation.

Types of Worms

There are many varieties of worms which infest poultry, impairing their general health and condition. Some infest the throat, windpipe, and gizzard, but the more common varieties, which probably affect the productivity of the laying fowl most, are those which infest the intestines. They can be classed in two groups—tapeworms

and roundworms. The tapeworms are flat, tapelike, and segmented, and the roundworms are round, pointed at each end, and unsegmented, being usually greyish-white in colour and varying in size and thickness according to age and variety.

Tapeworms

The tapeworms are found in a number of varieties. Some large ones are five or six inches long, while others are very small and can be seen only by the aid of the microscope. They attach themselves to the lining of the intestines by means of suckers. The larger varieties are found in the main intestine, and the small ones usually infest the small intestine just below the gizzard. These small varieties are generally most fatal, often completely upsetting the digestive system and finally causing death. New segments continue to form just behind the head, and as the tapeworm grows the end segments containing fertilised eggs are detached and pass away with the excrement of the fowl. These segments are eaten by intermediate hosts—flies, slugs, snails, slaters, and earthworms, etc.—in which the eggs develop to the infectious stage. Birds become infested by eating these hosts containing the developed tapeworm eggs.

The prevention of tapeworms can therefore be controlled to a very great extent if this life cycle can be broken. Intensive housing in well-constructed houses with wooden, asphalt, or concrete floors will often achieve the object.

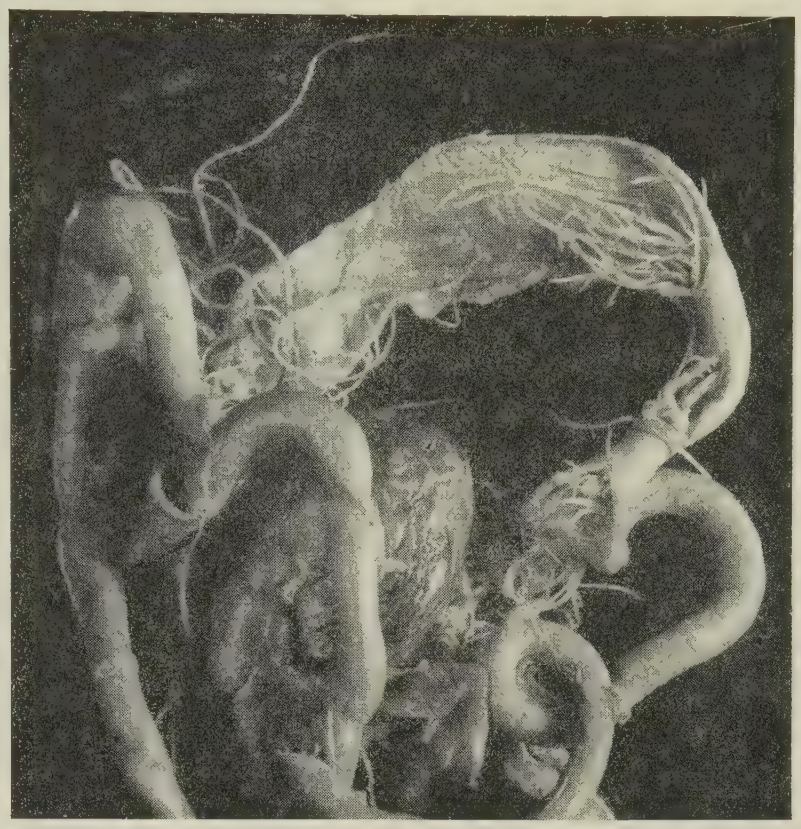


Fig. 2.—Heavy infestation of the small intestines of a fowl with the large roundworm, *Ascardia galli.*

[*A. L. Bryant, photo.*

Roundworms

Roundworms are the most common in all poultry, and while they seldom cause heavy mortality if kept under reasonable control, they are responsible to a very great extent for retarding the growth of young stock. Many young pullets fail to come into profitable egg production in the early autumn each year through being infested with these parasites.

There are a number of varieties of roundworms which affect poultry, but the two which are commonly found are the caecal worm and the large roundworm. The caecal worm, *Heterakis gallinae,* is normally a harmless parasite of fowls, and is found in the caeca or blind gut, from which it takes its name. The treatment given for other worms will usually dispose of a large number of these worms at the same time.

The large roundworm, *Ascardia galli,* is found in the main intestinal tract in various sizes according to the stage of development, and will be found from 1½ inches to 4 inches in length. The eggs, which cannot be seen with the naked eye, are deposited by the female worm in the intestine and passed out with the excrement. Under favourable conditions of moisture and warmth small worms develop within the eggs in from 10 to 16 days, and if eaten by susceptible birds, the young worm is hatched.

A period of from 50 to 60 days is required for the young worms to reach maturity, and the females are then capable of producing eggs and starting the cycle over again. Thus, a flock of poultry can very quickly become infested with these parasites where suitable conditions for development exist.

Symptoms of Worms

A common indication of worms is when the birds stretch their necks and make a screeching noise somewhat similar to a seagull, often combined with frequent yawning; other symptoms are loss of condition, feathers loose and ruffled, the comb and face pale, and a glassy appearance in the eyes. The appetite is often increased at first and later impaired, and the excrement is thin and contains a good deal of yellow slime. In young birds there is general unthriftiness and retarded growth, and often a weakening of the legs and great tendency to sit about. With adult fowls, this is not so noticeable.

The accompanying photographs were all taken at the Department's Animal Research Station at Wallaceville, and Fig. 1 shows acute parasitic infection in a growing pullet. The symptoms shown are similar to those of other poultry ailments. It is therefore always advisable for a poultry-keeper to kill a sick bird where he suspects worms, cut open the intestine from the gizzard down, and make a thorough examination. This is really the only certain way to diagnose the trouble.

Fig. 2 illustrates heavy infestation of the small intestines of a fowl with *Ascardia galli,* large roundworm.

Fig. 3 shows a collection of *Ascardia* from one bird in a Petri dish. In the scale, one division equals ½in.

Treatments

Many treatments are recommended. For instance, 2 teaspoonsful of spirits of turpentine with 1oz. of Epsom salts and 1oz. of sulphur to every 12 birds, fed in the mash, has given good results.

Tobacco dust fed at the rate of 2 to 3 per cent. in the mash has been advocated for many years. Copper sulphate given at the rate of 1oz. to 30 birds has been found effective in removing worms from adult birds when in the moult, and the use of nicotine sulphate and Epsom salts has given good results.

There is little doubt that individual treatment is probably the most effective of all, but in the larger plants it is not always practical, and flock treatments have to be adopted.

Several experiments have been tried at the Wallaceville Poultry Station in the treatment of birds affected with worm, but the use of nicotine sulphate gave the most satisfactory results. The birds were starved for a day before the dose was given, and the nicotine sulphate was used in the proportion of one liquid ounce for each hundred adult birds. This was added to the water with which the mash was moistened, and in the same water ½lb. of Epsom salts was also added and well dissolved before mixing in the mash. Sufficient mash was moistened with the water mixed with the nicotine sulphate and salts, so that each bird had about 1oz. of mash. It is important for the troughs to be sufficiently long so that all birds in the flock can feed at once and in comfort. It must be clearly understood that nicotine sulphate is poisonous, and that on this account the dose stated must not be increased; otherwise, fatal results may follow.

In most cases for a few minutes after the birds have eaten the first mouthful or two of mash they will lose the power of their legs and give indications that they are likely to succumb under the treatment. The birds will soon recover, however, and regain a normal state, provided, of course, that the amount of nicotine sulphate is not given in excess of the quantity stated.

Treating Small Flocks

When small flocks are to be treated, it is a good plan to add 9oz. of water to 1oz. of nicotine sulphate and to use 1oz. of this mixture to every 10 birds. The effect of this treatment given after a fast will be to expel the worms. It is therefore strongly advisable to confine the affected birds to the house for at least the next day after being treated so that the cleaning-up process may be properly carried out, thus avoiding the risk of the runs becoming further infested. Care must be taken to clean up thoroughly and remove all droppings after the treatment, and, in addition, the quarters should be given a good spraying with strong disinfectant.

It is a good plan to place wire netting over and in front of the perches so that the birds will not have an opportunity of picking among the droppings after being treated. The treatment may be repeated in, say, two weeks' time if desired.

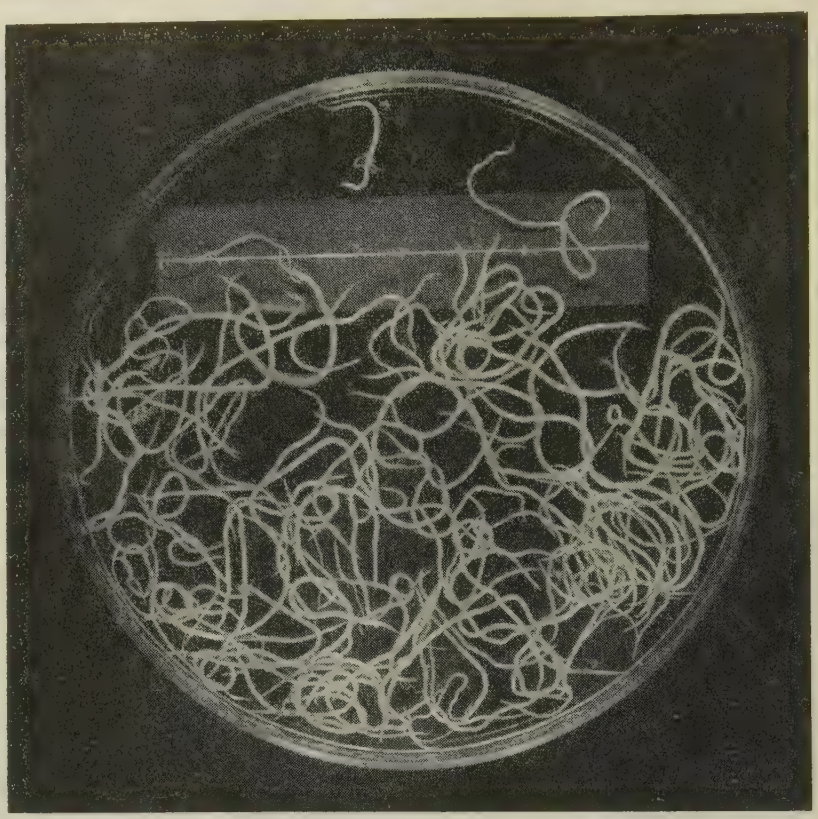


Fig. 3.—A collection of *Ascardia* from one bird in a Petri dish. In the scale, one division equals ½ inch.

[*A. L. Bryant, photo.*

Individual Dosing

The above method is quite effective in helping to keep the intestinal parasites under control, but, like all other treatments, it is well known that 15 to 20 per cent. of these parasites escape from being expelled, and if some birds show symptoms of still being fairly badly affected, individual dosing of these few birds under isolation will prove useful in preventing a further rapid recurrence of the trouble.

In the field work some poultry-keepers complain of the difficulty in getting the poultry to eat the mash with nicotine sulphate in it. This is true to a certain extent, and particularly does this apply if the birds have not been fasted long enough beforehand. A good method of overcoming this trouble is to use a tonic in the drinking water at the rate of one tablespoonful to each gallon for three days before the treatment, or to use two tablespoonsful to each gallon of water with which the mash is mixed each day for the same period. This has the effect of making the birds keener on the food, and they will eat the treated mash more readily. It is also quite a good plan to continue the tonic for three days after the worm treatment, as it appears to assist the birds to recover more quickly.

Suitable Times For Treatment

Generally speaking, it is recognised that a treatment such as that recommended is always liable to check egg production, and with the object of preventing this it is advisable to treat for intestinal parasites only twice a year. Young maturing pullets should be treated about one month before laying, which will always assist in improving the egg production during the early autumn and winter months.

The adult birds may be treated about the end of April when in the moult, and even given two doses if necessary. No loss in egg production will be noticed, as these birds are seldom laying at that time.

(*Continued on page 60.*)

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Pilot Officer E. W. Barnett.

Dominion President's New Year Message To Young Farmers

ONCE again the festive season is over, heralding the end of another calendar year—a year that has been an eventful one in the history of the British Empire, and, I venture to say, in the history of the whole civilised world. This has been the second New Year since there was again forced upon peace-loving peoples the trials and troubles of war; forced upon them through the insane ambitions of a man who has set himself up to dictate the mode of life to the peoples of Europe; one who would deprive them of those things which are most dear to the heart of man—freedom of thought and action.

During the past year the peoples of the British Commonwealth of Nations have responded to the call of their leaders to resist the efforts of Nazidom in its bid for world domination; and, in particular, the manner in which the people of Great Britain have responded to that call, and the courage and determination they are exhibiting during these days of tribulation has aroused the admiration of their compatriots, and indeed the admiration and respect of other nations that are remaining neutral.

So, then, as one organisation in a country which, although the smallest partner in the British Commonwealth, is by no means least in loyalty and service, we should strive to our utmost to uphold that tradition of fortitude, self-sacrifice, and courage. In reviewing what we as an organisation have accomplished during the period of the war, it is evident that we have more than held our own with other organisations in assisting in the various public appeals for financial and other assistance; but we have done more than that, for we have kept our organisation alive; kept it active in the provision of many things which are of value to the young farmer, and the older farmer, too, in their effort to render to the country their part in the war effort—increased production.

The members of our organisation are now divided into several classes. Firstly, those who are serving overseas; secondly, those who are serving in some capacity with the Forces at home; thirdly, those who are waiting to enter the Army, Air Force, or Navy; and, lastly, but by no means least, those who, through force of circumstances, are serving on the land. To each of these sections I would like, as your Dominion President, to give what may be termed a New Year message.

To those who are serving overseas, I would say that although you are no longer active in our organisation, you are not forgotten. Each and every one of you has, through your action in volunteering for overseas service, placed yourselves on a plane which all would strive to reach. You have shown that you have within you those qualities of service and unselfishness which are the hall-mark of character; have shown a realisation and appreciation of the responsibilities of citizenship in its widest sense, and have shown that there are yet those who are willing and able to accept from their forbears the torch of freedom and liberty, and carry it on. Those of us who remain behind will strive as you do to "do our bit"; to assist you all we can on the "home front"; to give to you those supplies which are so necessary to the waging of a successful war; and to ensure as far as possible that everything which it is within our power to provide, whether in goods or material assistance of some other kind, is ready when the call is made. You did not fail us when the time came, and we shall not fail you.

To those of you who are serving in some capacity or other with the Forces at home, I would say that you also are "doing your bit." Many of you have in all probability volunteered for

overseas service, and because of some specialised knowledge which you may possess, have been retained here for instructional and other duties. To you then, and to those who are waiting to enter some section of the armed Forces, I would say just this: Remember that although the job which you have to do may not of necessity fall into that sphere which you may desire, and may not be one in which you feel you are being of the greatest service, it is, in no matter how small a degree, a vital part of our defence system, and as such is worthy of all the service that you can give. Remain, then, steadfast, and continue to set to the rest of the community an example of service, self-sacrifice, and fortitude, which should be the goal of all who would serve their King and their country.

And now, to those who are remaining on the land, I feel that there is one thing above all that I should say, and that is, "Do not belittle the importance of your job." Wars are fought and won not alone with strength of arms and by men in the field, but by the co-operative, productive effort of all sections of the community, and in importance from a productive point of view your job ranks first. So remember, then, that it is necessary to pursue your job with the will to win and a determination to overcome all obstacles, so that in the final analysis it can be said that one of the greatest contributing factors in the winning of the war was the assistance rendered by that section of the community who served on the land.

In conclusion, then, may I wish you all, wherever you may be, and in whatever sphere you are serving, the very best wishes for the New Year.

—E. W. BARNETT (Pilot Officer, R.N.Z.A.F.), Dominion President, N.Z. Federation of Young Farmers' Clubs.

Y.F.C. Shearing Activities in Manawatu

By L. EARL, District Secretary, Palmerston North.

DURING 1938 and 1939 the Wellington Council staged their annual shearing contest at the Manawatu A. and P. Spring Show. These contests were a huge success, and many Y.F.C. shearers came long distances to take part. This event was a great draw at the show, as well as being an opportunity for the Y.F.C. men to show how they could shear and combine to time on a really big event and make a success of it. This year it was seen that we could not stage anything on those lines, but it was recognised that some form of shearing activities could be carried out.

The Manawatu Executive decided to ask clubs to hold shearing field days of their own, and then combine in one big field day at the beginning of November at Messrs. Levin and Co.'s shearing shed at Feilding. This arrangement met with unanimous approval, and most of the clubs in the pastoral districts held very successful days. A point was stressed that, as far as was practicable, young shearers and learners were to be encouraged, and in nearly all cases competent shearers and classers were in attendance, and those present were able to pick up many points both at the demonstration and then by actual tuition.

So far, the results at hand are from Pohangina Y.F.C. and Waituna Y.F.C., as well as the combined contest.

Waituna

The Waituna Club held its field day on October 28 at Mr. L. T. McLean's woolshed. This day, Labour Day, was extremely wet, but the sheep had been shedded and were in good condition for shearing.

A group at the Pohangina Valley Y.F.C. Shearing Field Day. Mr. Roy Mowatt, wool expert, N.Z. Loan and Mercantile Agency (third from right in front row) gave a demonstration on preparing a wool-clip for war-time conditions.

The judges for the various events were as follows:—Y.F.C. classes, Messrs. A. B. Shannon and J. M. Old; best shorn sheep, Messrs. C. Strawbridge and N. Guylee; fleece-o competition, Mr. F. Woolford; timekeeper, Mr. N. Guylee.

An open competition was also held, the judges being Messrs. A. B. Shannon and L. T. McLean.

Results were as follows:—

Championship Class.—I. H. Old, 1; J. Revell, 2; R. Meads, 3.

Intermediate.—F. Sowerby, 1.

Junior (shear more than 50 but less than 100 per day).—G. Gledhill, 1; A. E. Sowerby, 2.

Learners' Class (under 50 per day). R. Woolford, 1; C. Nicholson, 2.

Best Shorn Sheep (to be judged during the competition; trophy donated by Mr. N. V. Shannon).—I. H. Old, 1; A. E. Sowerby, 2.

Fleece-o (pick up, throw, and roll). —L. Small, 1; F. Sowerby, 2; R. Meads, 3.

Open Event.—J. M. Old, 1; P. Shannon, 2.

Mr. J. M. Old is an advisory member of the club, and was also one of the judges, so he had a day out. A class for judging the weight of the

sheep (trophy donated by R. Meads) was also won by Mr. Old.

The members of this club were highly pleased with the results of this day and the support they gained in the district. The tuition and assistance were greatly appreciated, and it was felt that the day had been really worth while.

Pohangina Valley

Pohangina Valley Y.F.C. also held a successful day at Messrs. Moore Bros.' shed at Pohangina. The field day was purely for instructional purposes, with Messrs. Smart Bros. as instructors, and Mr. Roy Mowatt, wool expert from the New Zealand Loan and Mercantile Agency Co., Ltd., gave an outstanding demonstration of preparing the wool clip as is required under the war regulations. There was a large attendance of Y.F.C. members and farmers from the district.

Colyton and Kimbolton held similar field days with good results, the members being well satisfied with their efforts. Unfortunately, the detailed results are not to hand, but will be announced at a later date.

Council Competition

The shearing field days culminated at Levin and Co.'s shearing shed, Feilding, on November 1. More than 60 Y.F.C. members entered, the weather was fine, and the contest was finished on time. We are greatly indebted to those people and officials who assisted us on that day, particularly to those who donated trophies, namely:—Championship Cup, presented by New Zealand Farmers' Distributing Co.; Intermediate Cup and Junior Cup, R. O. Gloyn, chairman, Manawatu Executive; Fleece-o Trophy, New Zealand Farmers' Co-op. Distributing Co.; Club Team Trophy, Y.F.C. Council; Place Trophies, Abraham and Williams, Ltd., New Zealand Loan and Mercantile Agency Co., Ltd., Dalgety and Co., Ltd., Hodder and Tolley Ltd., Feilding Sash and Door Co., Ltd., Parkes and Co., Ltd., Ashhurst; trophy for neatest shearer (junior), Mr. Farquharson (owner of sheep).

The officials were:—Judges, W. Howell (Ashhurst), H. A. Stewart (Feilding), J. M. Old (Waituna), D. Scott (Aokautere), and A. C. Morton (Massey College). Committee, H. M. Linklater, D. Scott, A. C. Morton, A. J. Galpin, W. Howell, A. C. Buist, I. H. Old, and I. D. Colquhoun.

Results were as follows:—

Championship.—A. Sowerby, Waituna, 289 points, 1; C. Dickson, Mangaweka, 267, 2; Blixt, Pohangina, and I. Old, Waituna, 263, 3 (equal).

Intermediate.—F. Toms, Mangaweka, 252 points, 1; R. O. Gloyn, Rongotea, 250, 2; G. Mitchell, Kairanga, 248, 3.

Junior.—E. Toms, Mangaweka, 258 points, 1; A. Moore, Ballance, 251, 2; G. Gledhill, Waituna, 245, 3.

Neatest Shearer (Junior).—E. Toms and G. Gledhill, 99 points, 1 (equal).

Teams.—Mangaweka (E. Toms, F. Toms, C. Dickson), 777 points, 1; Wai-

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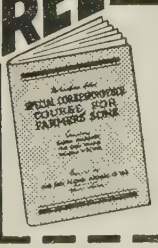

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tuna (G. Gledhill, F. Sowerby, I. Old), 755, 2.

Junior.—First heat: G. Gledhill, Waituna, 1. Second heat: L. V. Ward, Feilding, 1. Third heat: A. Moore, Ballance, 1. Fourth heat: E. Toms, Mangaweka, 1.

Intermediate.—First heat: F. Toms, Mangaweka, 1; F. Sowerby, Waituna, 2. Second heat: G. Mitchell, 1; R. O. Gloyn, 2.

Championship.—First heat: C. Dickson, Mangaweka, 1; A. Sowerby, Waituna, 2. Second heat: I. Old, Waituna, 1; P. Green, Mangaweka, 2.

At the conclusion, Mr. A. C. Buist presented the championship challenge cup to Mr. A. Sowerby and congratulated him on his win, and expressed great pleasure at the way in which the Young Farmers' Clubs had entered into the important task of becoming proficient shearers. He also mentioned that he had a cablegram from Mr. V. Freeman, last year's winner, who is now overseas with the First Echelon, wishing the winner of this tournament the best of luck.

It is hoped that next year we will be able to carry on with this scheme and, if possible, enlarge upon it, because, after our experience this year, we know that our efforts have the backing of the whole pastoral community.

Cheery Letter from Y.F.C. Secretary In Scotland

THE following letter has been received from the Organising Secretary of Young Farmers' Clubs in Scotland:—

Old Army Building, Rose Terrace, Perth, September 25, 1940.

S. Freeman, Dominion Organising Secretary, New Zealand Federation of Young Farmers' Clubs, New Zealand.

Dear Mr. Freeman,—

I have been reading with interest the reports of your Young Farmers' Club activities in issues of the New Zealand "Journal of Agriculture," and cannot help thinking how lucky you are in being able to continue the good work on, apparently, very much the same scale as before the war.

As is only to be expected we "up here" in the theatre of war have had to alter our programme considerably. Stock judging has gone by the wall meantime, and so our natural desires to examine and judge good stock, well fed, well groomed, and well led, cannot be fulfilled. We are not short of petrol, but conserve what we get, and so our other activities, lectures, debates, discussions, socials, etc., have been reduced in number and have been more local in nature. Perhaps in this respect we are making some use of the emergency, for clubs now depend ever so much more on the initiative and ability of their own members and prominent local farmers. I hope that after the battle is over and won and we return to our more normal life the Young Farmers will still use this way of carrying on their activities.

Now what I really want to say in this letter is to extend an invitation to any of your members who are on active service in Scotland to get in touch with me, letting me know where they are stationed so that I may be able to put them in touch with some of our club members. They are a long way from home, and on leave they may wish to get back to farming for a little while. Anything that can be done through this Association will be done with a very pleasant sense of duty to those who are resolved—as we in this country all are—to see this thing through to its successful conclusion. If any members will write me at this office I will do my best to have them put in touch with our club members.

I am sure that the National Federation of Young Farmers' Clubs of England and Wales (address: Oaklings, Cannons Close, Radlett, Herts., England) and the Young Farmers' Clubs of Ulster (address: 35 Ocean Buildings, Belfast, Northern Ireland) would wish me to express a similar invitation on their behalf.

In conclusion, may I say how pleased I am to get the "Journal" regularly each month. It provides interesting reading—and a feeling of a link between us.—Yours faithfully,

(Signed) R. M. CHAMBERS,
Organising Secretary.

Tree Planting by Inglewood Club.

J. V. MacINTYRE, Hon. Secretary, Inglewood Club.

AS the particular kind of trees required by the club were not available from Christchurch through the Y.F.C. Tree Planting Scheme, the club decided to purchase 27 native trees of different varieties from nurserymen in New Plymouth. These were duly procured and planted on September 19 in fine weather.

The Inglewood Public Schoolgrounds was selected as a suitable site, and members attended and prepared the holes and planted the trees. The chairman and secretary of the school committee were present, and expressed gratification, particularly at native trees being planted, as these were considered an ideal memorial to the early settlers of the district. It is the club's intention to keep the trees clean and to erect a notice stating when the trees were planted and by whom.

On the same evening the club held a patriotic dance in conjunction with the Junior Branch of the Women's Division of the Farmers' Union. The dance was a great success, and realised the sum of £10 10s. The committee responsible for the tree-planting and the dance were:—J. T. Stackurski (club chairman), J. V. MacIntyre (secretary), and M. B. Rowan (treasurer).

Obituary

B. T. Conlan

IT is with profound regret that the death is announced of Brian T. Conlan, son of Mr. and Mrs. T. Conlan, "Waireha," Tunakatekate Valley, Taumarunui, as the result of an accident which occurred on Mount Ruapehu. The late Brian Conlan was an enthusiastic farmer and a keen and popular member of the Taumarunui Young Farmers' Club.

Rongotea Club's Parents' and Friends' Evening

PARENTS and friends were welcomed by members of the Rongotea Young Farmers' Club at a recent meeting. They attended to gain an insight into what is being accomplished, and were unanimous in their commendation of the club's activities. Mr. J. H. Gibbons was in the chair.

A motion of sympathy with the advisory president (Mr. H. J. Lancaster), who has recently lost a brother, was moved by the chairman, and those present stood for a moment in silence.

The business part of the meeting was run on ordinary lines for the edification of the visitors. It was decided to hold a field day for instruction in shearing on Mr. J. C. Gibbons's farm, the matter being left to the committee to arrange.

Mr. Lancaster drew attention to the display of trophies in the hall, at present held by the club, which included the Wellington Farmers' Union Challenge Cup, awarded for general efficiency in club work; the P. G. Cope Challenge Cup, for inter-club sports competition; Mrs. M. Wills's challenge cup for the farm roots competition; and the Vile Shield for debating. He congratulated the club on its achievements, and stated that he was proud to be associated with it. Mr. W. Wildbore, a visitor from the Apiti Club (semi-finalists in the debate) also congratulated the Rongotea Club on winning the debate. Mr. R. O. Gloyn expressed the appreciation of the debating team.

Formal business disposed of, a club debate took place, the subject being "That the Tractor Can Economically Supersede the Horse for General Farm Work." The teams were as follows:—Affirmative, G. Pearson, K. Redmayne, and D. Lind; negative, M. Lind, C. Hunt, and R. Hill. The adjudicator, Mr. H. Fox, said that the matter incorporated in the debate and the manner of delivery were excellent. The contest was very even, and he declared the affirmative side the winners with 171 points against 159. He gave the contestants some very sound advice, showing them how they could improve their standard of debate.

The Dominion Organising Secretary, Mr. S. Freeman, exhibited a series of moving pictures with sound accompaniment, covering a wide range of subjects of educational and general interest.

Supper was handed round by members, and this gave the opportunity to introduce a large birthday cake, which was much admired. It was made by Mrs. J. C. Gibbons, and was iced and decorated in a most original manner by Miss N. Dear, the use of miniature farm animals and poultry giving it a topical interest. The five candles surmounting it were lit by Miss B. Gibbons, and blown out by Miss M. Pearson, and it was then cut in sections by Mrs. Lancaster.

Mr. Freeman expressed keen interest and pleasure in the evening's entertainment, and stated that the Rongotea Club held a foremost position among clubs in the Manawatu district, which for various reasons—soil, climate, close settlement, etc.—ranked very high in the Dominion for its farming status. Rongotea should be proud of the manner in which its farming youth had distinguished themselves. He considered the Parents' and Friends' evening to be a very fine idea, as it should do much to interest other members of the community in the work of the clubs.

Mr. Redmayne, sen., spoke on behalf of the parents in attendance, and stated that they had all spent a most instructive and enjoyable evening, and would be pleased to be present on a future occasion.

Organising Secretary's Visit

By W. D. POWDRELL, Chairman, Wairoa Club.

THE official visit to Northern Hawke's Bay, by Mr. Sydney Freeman, the Dominion Organising Secretary of the Federation of Young Farmers, made a very interesting week for the various Young Farmers' Clubs who had the privilege of his visits. Mr. Freemen brought with him his cinomatograph apparatus, which added considerably to the interest and educational value of his addresses.

His itinerary was an extensive one, starting at Meeanee on Monday, October 21, with an attendance of 31 members of the Young Farmers' Club. Tuesday saw him at Hastings, where a debate took place between the Wairoa and Hastings Clubs. Wednesday was spent at the Hawke's Bay A. and P. Show, concluding the day with his attendance at a meeting of the Northern Hawke's Bay District Committee, presided over by Mr. W. J. Brownlie. Mr. Freeman then travelled to Wairoa on the 24th, on the night of which he addressed 24 members of the Wairoa Young Farmers' Club, and on the following day he returned to Hawke's Bay and addressed an enthusiastic meeting of 28 members of the Matapiro Club.

The thanks of the various Young Farmers' Clubs are due to Mr. Freeman for his entertaining and instructive addresses, and it is our desire that we may be favoured with another visit at an early date.

Football Match

By H. J. POFF, Hon. Secretary, Methven Y.F.C.

A FOOTBALL match between Methven Y.F.C. (challengers) and Hinds Y.F.C. was played on the Hinds football grounds, the teams being as follows:—

Hinds.—D. Chisnall (captain), C. Bevin, J. Tait, E. Withell, D. G. Tait, K. McConnell, W. McConnell, G. Watson, R. Watson, M. Davidson, J. Gibb, T. Gibb, R. Ferriman, R. Reddicliffe, W. S. Keeley, and J. Proctor.

Methven.—W. Lock (captain), D. Campion, C. Middleton, T. Middleton, C. Watson, T. Green, D. McLaughlin, K. O'Reilly, P. O'Reilly, J. McKendry, E. Body, C. Body, H. Poff, A. Low, and H. Alexander.

From the kick-off play was willing, and some fine individual efforts were seen. The Hinds pack held a small advantage in weight, which began to tell on the Methven pack in the second spell, but this disadvantage was offset by the speedy Methven backs. A feature of the game was the solid tackling by both sets of backs.

Methven won by 17 to 3. The referee was Mr. E. Newman. Scorers for Methven were P. O'Reilly, two tries, C. Middleton, W. Lock, and A. Low, one try each; K. O'Reilly converted a try. J. Proctor scored the try for Hinds.

Among the Clubs: Reports on Activities

Western Southland.

Orepuki.—General business. Lecture by Mr. W. L. Harbord, Department of Agriculture, on "The Founding of the Linen Flax Industry."

Eastern Southland.

Balfour.—Members chosen to act as stewards at Gore A. and P. Show. Short speeches by two club members, "The Advantages of Running Cattle on a Sheep Farm" and "The Various Processes a Calf Goes Through at the Freezing Works."

South Otago.

Clutha Valley.—Debate held "That Tractors Are More Economical Than Horses." G. Braid, W. Small, and J. Anderson took the affirmative, while the negative side was taken by D. Coll, R. Stirling, and A. Pannett. The latter team gained the decision.

Clinton.—General. Mr. H. Steel, Clinton, addressed the meeting on "Early History of South Otago."

Lawrence.—General business. A talk was given by Mr. S. Bowie, his subject being "My Experiences in England."

Waripa.—General. Mr. E. Holden, of Waiwera, gave an interesting and instructive demonstration of blade shearing and also discussed the way to roll fleeces.

Central Otago.

Roxburgh.—The speaker for the evening was Mr. C. V. Dayus, Department of Agriculture, whose subject was "Milk Fever in Cows, Sheep, and Sows." He also gave a short talk on "Increased Pig Production."

Dunedin.

South Taieri.—New Secretary elected. Mr. A. Miller, of Maungatua, addressed the meeting on the subject of "Stock Judging."

West Taieri.—General. Mr. A. Miller gave a short address on "Stock Judging Competitions." Dance held for remainder of the evening.

North Otago.

Five Forks.—An open meeting held. The International Harvester Company's talkie film shown by Messrs. Lyons and Neill.

South Canterbury.

Geraldine.—Decided to hold a combined Y.F.C. Farmers' Union and W.D.F.U. dance in aid of patriotic funds. The evening was spent in social activities.

Pleasant Point.—Report on Field Day held recently at Lincoln College. Two members gained places in stock judging at Timaru A. and P. Show—A. Crombie, 3rd Sheep Judging, and A. Talbot, 3rd, Horse Jumping. Mr. A. Shipley, of the International Harvester Company, gave a talk on "Running Repairs and Maintenance of Farm Tractors."

Christchurch.

Darfield.—Final arrangements for stock judging competitions, to be held at Courtenay A. and P. Show. Barn Dance showed a profit of £9 3s. A lecture on "Coal Gas As Applied to Farm Tractors."

Ellesmere.—General. Talk by Mr. J. Simpson on "Pig Keeping." A Field Day was held recently in Christchurch. The party was conducted through the following factories:—Lichfield Shirt Co., Ltd., Bunting and Co. (Brush Manufacturers), I. H. Green and Co., Ltd. (Bacon Curers), and Woolston Tanneries, Ltd. (Leather Manufacturers).

North Canterbury.

Scargill-Omihi.—Field Day to be held. Mr. Howarth spoke on "The Preparation of the Wool Clip."

Wairarapa.

Carterton.—An address on "The Work of the Various Divisions of the Department of Agriculture" was given by Mr. N. Lamont. At a previous meeting speakers were selected for the proposed debate with the W.D.F.U. Mr. F. Bettelheim, of Wairarapa Seed Company, lectured on "Potato Growing."

Martinborough.—General. Talks by club members on various agricultural topics.

Horowhenua.

Johnsonville.—Arrangements for Shearing Contest. Gifts to be sent to members on active service. Purchase of health stamps for use on correspondence. Discussions by club members on everyday farming problems.

Manawatu.

Feilding.—New member elected. Annual Dinner to be held. Two teams entered for Judging Competitions at Feilding Show.

Fitzherbert.—Arrangements made to hold a Patriotic Ball. Dr. Vernon gave a moving picture display depicting "Agricultural Work in Great Britain and on the Continent."

Kimbolton-Kiwitea.—General financial matters of club discussed. Report on shearing demonstration.

Opiki.—Business meeting.

Rangiotu.—General. A lecture entitled "Stock Diseases—Causes and Cures" was delivered by Mr. J. Hill-Motion, M.R.C.V.S.

Rongotea.—Shearing Field Day to be held. Two teams entered in Chisholm Shield Judging Competition. Third Annual Parents' and Friends' Evening. Club debate "That the Tractor Can Economically Supersede the Horse for General Farm Work." Speakers: Affirmative, G. Pearson, K. Redmayne, and D. Lind. Negative, M. Lind, C. Hunt, and R. Hill. The affirmative side gained the decision. Mr. S. Freeman, Dominion Organising Secretary, also showed a number of films.

Whakarongo.—Final arrangements for Field Day. Mr. L. Earl, Department of Agriculture, showed some films.

Central Taranaki.

Cardiff.—Eight entries received for Stack Building Competition. Notes for radio talk read. Trees planted as a Centennial Memorial. Mr. L. Knowles was the speaker for the evening.

North Taranaki.

Hillsborough-Tarurutangi.—General. Mr. D. LeC. Morgan (North Taranaki Farmers' Union) gave an instructive address on "Methods of Farm Bookkeeping." Field Day held at Katere Experimental Area. Demonstrations by Mr. J. M. Hopkins, Department of Agriculture, included experiments showing the results obtained in (a) the sowing of pasture with different weights of seeds per acre; (b) use of various manures on pastures; and (c) spring and autumn sowings of grasses on plots ploughed, and on others just disced.

Inglewood.—General business. Pilot Officer E. W. Barnett, Dominion Y.F.C. President, spoke on "Training Air Force Personnel."

Mangorei.—A general discussion took place on the subject "The Value of Shelter to the Farmer." At a previous meeting Mr. J. M. Hopkins, Department of Agriculture, gave a lantern lecture on "Various Methods of Making Ensilage."

Central Hawke's Bay.

Onga Onga.—General. Short talk by S. T. Carter on "Pampas Grass." Discussions took place on "Wool," "Footrot in Sheep," and "Machine Milking Without Stripping." C. Masters then read a humorous article on "Farming."

Northern Hawke's Bay.

Meeanee.—Greeting cards to be sent to all Y.F.C. clubs in the district. At a previous meeting Mr. A. D. Laing, Department of Agriculture, spoke on "Mastitis and Abortion." He also mentioned something of farming conditions in South Africa.

Putorino.—Field day arranged. Mr. Les. James gave a talk on "Farm Engines." At a previous meeting Mr. Wilding, of New Zealand Loan and Mercantile Company, addressed the meeting on "Seeds, Grasses, and Clovers," while C. Anderton, Club Secretary, spoke on "Fencing."

Wairoa.—General. Dr. R. B. Grey screened slides of his experiences during his recent "War Work in China," and told members of the customs and conditions in China. Mr. Bernard Teague gave the first of his lantern lectures entitled "Seeing New Zealand With a Camera."

Poverty Bay.

Te Karaka.—New member enrolled. Mr. S. Freeman, Dominion Organising Secretary, showed a number of talking films of topical interest. At previously unreported meetings Mr. F. Wise spoke on "His Trip Through U.S.A.," and Mr. E. M. Bates, Department of Agriculture, gave an address on "Growing of Pumpkins" and "Experiences of Piloting an Aeroplane." Mr. G. M. Whitham lectured on "Herd Improving," while Mr. R. E. Alexander, Department of Agriculture, gave a talk on "Tuberculosis."

Eastern Bay of Plenty.

Waimana.—Business meeting.

Western Bay of Plenty.

Kati Kati.—General discussion on various agricultural subjects.

Te Puke.—General. An address by Mr. D. S. Ross on his tour of the British Isles in 1930.

Waikato.

Hauraki.—Lecture by Dr. N. Seigal, D.V.S., on "Stock Diseases on the Hauraki Plains."

Auckland.

Clevedon.—General business. The speaker for the evening was Mr. H. Woodyear-Smith, who lectured on "Hay and Ensilage Making" and illustrated his talk with several films. At a previous meeting Mr. S. Freeman, Dominion Organising Secretary, addressed the meeting on "Y.F.C. Affairs," and also showed a number of talking films of topical interest.

Franklin.—Business meeting.

Harrisville.—A debate held, the subject being "That the Practical Farmer Has Done More for the Advancement of Farming than the Scientist." At a previous meeting Mr. S. Freeman, Dominion Organising Secretary, presented a very interesting talking film display.

Hunua.—Business meeting.

Warkworth.

Wellsford.—General. A lecture was given by Mr. P. S. Syme, his subject being "Top-dressing and the Maintenance of Good Grasslands."

Whangarei.

Kerikeri.—General business. A report was given by Mr. P. Everett, Department of Agriculture, on "The Experiments Taking Place on Mr. H. P. Ritchie's Passion Fruit Vines." Five-minute talks by members.

Matarau.—Discussion on stock judging competitions at Spring Show. Field day held on Mr. I. McDonald's property, which took the form of a lecture on "Feeding and Housing of Pigs on the Fattening Sty System."

Kaitaia.

Oruru.—General business. Dance to be held.

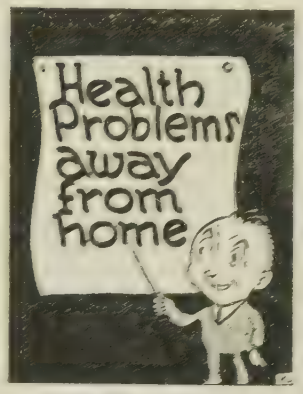
Health Notes for the Farm

Contributed by the Department of Health

Health Hints for Campers, Hikers And Holidaymakers

THIS season of the year creates in most of us an urge to depart for a while from the "daily round, the common task," and to recuperate amid rustic scenes by the sea, the river, the hills or the bush. There arises a craving for an opportunity of realising the joys of many pleasurable experiences denied in life's routine.

To realise such desires is beneficial to mind and body, and this is particularly so with the young if their vacation is wisely chosen and conducted. To assist to obtain the maximum of benefit from such a change to everyday life the following advice is offered, especially to those who go camping:—



Where to Camp

Choose a high and dry site, reasonably close to wood and water but take care you are well above ordinary flood level. Running water is preferable for many reasons; among others things, still and stagnant water harbours mosquitoes. It is better to have your camp cooking arrangements some distance from your sleeping quarters—the cooking arrangements nearer the water than the sleeping quarters, which are more free from flies by day and from mosquitoes by night.

Washing the Hands

Have a basin, soap, water and a towel convenient for washing the hands—otherwise they may not be washed often enough for hygienic purposes. Be careful where you get your water from. Boil it if there is any doubt about it. Cover it to protect it from flies.

Fires

No good camper ever forgets to see that his fire is put out after each meal and at night and that it is so placed that there is not a danger of it spreading. Lighted matches, cigarette or cigar butts may cause a fire if thrown down carelessly.

Many disastrous bush fires have been started by picnickers and campers. Think of the safety and well-being of others whose lives and property your careless actions may jeopardise.

Protection of Food

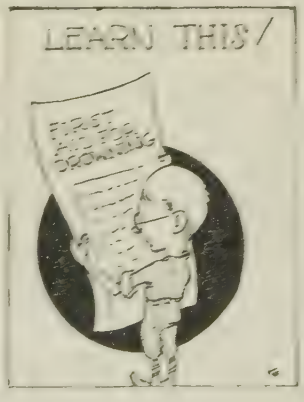
Mosquito netting to protect food is useful. Arrange it over the food so that it does not touch it, and tuck it well in underneath. No one wants his comfort spoilt by unwelcome food visitors.

Mosquitos

Mosquito nets help to protect you from mosquitoes. Do not have light in your tent. Hang mosquito netting over the door. Pour a little kerosene over any stagnant pool or puddle. Best of all, camp somewhere high and dry where there are not any mosquitoes.

Proper Management of Refuse

Proper management of refuse is important as among other advantages it reduces flies. Dispose of all refuse—liquids and solids—as soon as possible. Dry refuse should be burned, and this can be done at night when you have finished with the camp fire for



cooking. A sack hung on a post is the best thing for dry refuse and a petrol tin (preferably covered) for food refuse. Failing this, it should be neatly and thoroughly buried. Remember that the next camper is entitled to a clean, attractive camp site.

Waste Water

Waste water can usually be disposed of in a soakhole. The greatest difficulty is with grease—e.g., washing-up water. Grease soon forms a waterproof film over your pit or soakhole. To prevent this, dig a small trench leading to your pit or soakhole. Fill this trench with fern or tussock, or fine broom, or fine manuka, or gorse, or dry straw, or dry grass. Pour the water into this trench, and the grease is caught on the brushwood. Change the brushwood daily and burn it. Remember, even soapy water contains grease, and will in time clog a soakpit unless the grease is filtered out in some such primitive manner as described.

Disposal of Excreta

(a) Dig a hole of sufficient size to last a week. Place a petrol box across the hole with a circular opening to serve as a seat. This opening must have a piece of board or tin to act as a lid; keep a shovel handy, and see that each deposit of excreta is immediately covered with earth. It is only necessary to have a spade and a half depth of soil to cover the excreta.

(b) A petrol tin with a wire handle is placed under a petrol box with a circular opening and lid, as above. The contents of this tin are daily buried in a shallow hole as described. The tin should have a little dry earth sprinkled in and around it. A dessertspoonful of kerosene poured into it keeps down flies. For purely urgent use, a hole sufficient for the hygienic disposal of the excreta can be kicked out with the boot and the loosened earth used for covering.

How to Spoil Your Holiday

SPEED is important.
Whatever you do, rush!
Wear dark, heavy clothing; it absorbs the heat and is bound to make you cross and uncomfortable.
Worry a lot every day about your work and the folks back home.
Take all the baggage you can collect. Carrying bags is good exercise and you can spend your spare time looking for what gets lost.
Be sure to rock the boat. The practical joker is always popular.
Eat rich, heavy foods. Your stomach is lazy. Keep it busy.
Try to get a nice sunburn all the first day. You will!
Don't bother to sleep. It's a waste of time.
Pity the mosquitoes. They must bite somebody, let it be you.
Go without a hat, especially if you are not used to it. Sunstroke will only lay you up for a few days.
Drink the water from any old pond or brook. Take a chance.
Play's the thing. Never stop until you drop from exhaustion. Your heart's as sound as when you were a child—Maybe!
Flies are cute little things. Let 'em share your meals. They have wiped their feet before they came in.
Go out into the deep water, especially if you can't swim. The crowd like excitement.
Be sure to spend more money than you can afford.
Stay as long as possible and then miss the last train.

These suggestions are primarily for campers, but may prove useful to those who have to live in country placed under primitive conditions, where modern sanitation is non-existent.

Swimming

During camping and holidays at the seaside many look forward to swimming, an accomplishment valuable for the promotion and preservation of health. However, swimming is not without its risks, as shown in the number of tragic drowning accidents which occur every holiday season. To avoid such happenings it is advisable to swim only in a safe place when others are around, and not to overtax your ability as a swimmer.

Cramps may attack the strongest swimmer, hence swimming far out where help cannot quickly reach the swimmer is not wise. When diving, first explore the place to make sure of its depth and hidden dangers. Keep out of swift currents, and beware of the backwash.

A knowledge of how to apply artificial respiration on lines as advocated in articles already published in this "Journal" would be invaluable in case of need.

First-aid

It is wise to learn the fundamentals of first aid and to take along with you some simple first-aid requisites, or one of those compact first-aid outfits. The careless use of firearms causes fatalities. So do not fail to unload your gun when getting through a fence, and be sure the magazine is emptied before it is put away. Pay particular attention to the safety catch when you are in the field, and teach children the danger of pointing a gun at another person and how to carry a gun.

Vacation time is now at hand. A complete change from the daily grind is what many need—new faces, new environment, new activities. Be sure, however, to plan your holiday so that you will come back benefited in body and mind.

POULTRY NOTES.

(*Continued from page 52.*)

It should, of course, be recognised that parasitic life is more or less in the dormant stage during the cold winter months, but begins to multiply very rapidly in the spring, and with the object of keeping these parasites under control it is often necessary to treat the laying flock during October. This treatment will check the egg production to a certain extent, but will not have the effect of putting the bird into a moult or causing long delay in the laying period. A marked improvement is generally noticed in the condition of the birds after treatment, and the egg production is considerably improved during the summer months, when egg prices have a hardening tendency.

Young growing stock about three months old often show indications of intestinal worms, and if these symptoms appear it is a wise plan to give a treatment at this period to prevent any retarding of the growth, but sanitary measures should also be adopted.

APIARY NOTES.

(*Continued from page 49.*)

straining or gravitation, and where high temperatures are used to separate this type of honey from the combs, or to facilitate straining, the colour is darkened and the natural flavour destroyed to the point of caramelisation (spoiled honey).

Bee-keepers are therefore warned against the establishment of apiaries close to manuka areas if it is their intention to produce extracted honey for ordinary trade purposes.

The crystallisation of honey will be dealt with next month.—*T. S. WINTER, Senior Apiary Instructor, Wellington.*

THE Good Neighbour

BY "MARY"

FROM ME TO YOU

WHAT were YOU doing just now, before you picked this up? Were you in the midst of your baking when the mail came in? Or perhaps you were idling away a minute or two while the dinner was cooking; maybe you had drawn your chair to a cool spot, the day's work done. But, whatever you were doing, you didn't know that I was coming to visit you, did you? You have made no preparations to entertain me, done no special cooking, not even donned your newest frock to greet me. Yet, here I am, right at your fireside, eager to share your thoughts and desires, to know of your failures, and to rejoice in your successes. So, to-day, you are at home to me. To-morrow, may I be at home to you? There is so much joy to be had from sharing—as trouble shared is trouble halved, so is gladness shared, gladness doubled.

Yet, I have been forced to the conclusion that one is not meant to be too happy. I have found it true—many times. Whenever one's cup of joy seems to be overbrimming with happiness, something slips in—or maybe someone slips out—leaving an irreplaceable gap. But every friendship, and every incident, whether pleasant or unpleasant, is just another step in the Ladder of Experience, and I am glad that I have been through trouble and pain because it has made me richer in spirit, and more appreciative of everything that is good and beautiful. It provides the light and shade in life, which is so important in making character.

Maybe your vision is a little clouded just now, the ends of your life seem a little loose and frayed; loved ones going overseas. Perhaps there is a gap in your days? Well, here is another pathway opening for you. There are your pages—will you write to me, and let me share your joys and sorrows? I am always at home to you, happy to help or advise, ready to shed a tear with you, or to laugh with you.

Mary

What They Are Wearing . . .

MATERIALS this summer are lovelier than ever. The shops are full of gay patterns, and all so colourful. There seems to be a definite trend towards wearing bright colours nowadays, and a very happy idea it is too, with so much sadness about. Colour plays a most important part in one's outlook on the day's work: you know the feeling of confidence and well-being you assume when you know you are faultlessly dressed, and if you put on a gay frock, you just can't be blue. So, when you are shopping, shop brightly.

Young misses in the city streets are wearing those smart costumes with checked or striped coats, and plain skirts. Cyclamen and purple, with touches of grey for the coat, and a purple skirt, make a happy choice for the dark lass; while, if you are fair, try a combination of the ever-popular pale and deep blues. Plaid swagger coats are being very much worn this season—some of the new colourings are delightful. I saw a very smart coat of this style the other day in a deep green, with bright rust-coloured stripes. Very striking.

Dirndls are more popular than ever before. All the city shops are displaying them, in the merriest designs, in the gayest colours, and all the city folk are wearing them too. I think they owe their undoubted popularity to two factors: firstly, they are all "happy" frocks, and secondly, they launder and iron so easily. And in these busy days everyone welcomes a frock that looks its best with the minimum amount of attention.

Hats are broad-brimmed again. Not very much use to us in windy Wellington, except on those rare calm days,

but the chiffon square scarf, tied gipsy-wise around the head, is keeping in place the curls of the girls on every breezy day.

I saw and admired a most unusual frock in a shop window the other day. It was white georgette, the bodice tight-fitting and plainly cut, and the full skirt was embroidered with two

MY TREASURE.

Little wisp of straying hair
Gold across the white
Of the little cot where Babe is,
Tucked up for the night.
Droop the long dark lashes lower,
O'er the azure eyes . . .
Pearly ears they pay no heed to
My soft lullabies.
Flung outstretched the chubby arm
On the fleecy shawl,
Ten pink toes nestle closely
In a soft, warm ball.
Darling cherub, sent from heaven,
Sweetest dreams be thine.
God's own angels all will guard thee,
Sleep sweet, Baby-mine.

black cats, their tails up. Someone is going to look very coy when she dons this creation—lucky lass!

It's a grand feeling to be dressed again in the crisp linens and cool silks of summer days, and to know that the woollies we grew so tired of through the last months of winter are carefully tucked away with mothballs and tissue paper for a little while at least.

Waiting to be Won!

WHICH SHALL IT BE—FARM OR CITY?

ESPECIALLY now, in these days of wartime, the temptation is great to leave the farm and take up work in the city. There is so much the city has to offer a girl—bright lights, plenty of companionship, pleasant work in congenial surroundings—there are so many avenues opening for capable girls in shops and offices now that the boys are away. But, you say, these latter remarks apply more truly to the farm at present—here, too, the boys are away, and many a girl is helping as she never helped before in the effort to increase production. So—

"Should farm girls leave home now and take up work in the city"

It is a vital question—what do YOU think? Let me know your views before the 15th February, and don't worry if you feel you are not good at writing—it is originality of ideas that counts, not literary style.

Two prizes will be awarded: First 10/-, and second 5/-. Out with your pens and paper, and send your opinions to me:

"Mary"
C/o "Journal of Agriculture,"
P.O. Box 3004, Wellington.

¶ Closing date: 15th February, 1941

While the Log Burns . . .

A Book You Will Enjoy.

SOME months ago I read one of the freshest books I have ever had the good fortune to come across, "Letters to a Friend," by Winifred Holtby. When I had finished reading it, I felt I knew the writer almost as a personal friend. So, it was with joy that I chanced the other day upon "Testament of Friendship," by Vera Brittain, which tells the life story of Winifred Holtby. She must have been a charming woman—her spirit shines out in its courage from the pages of this book by Vera Brittain, who, in passing, was Winifred's closest friend.

"Testament of Friendship," while being the life story of one of the most outstanding women of our times, is written in a very easy and happy style. It tells of Winifred's early days, spent in a Yorkshire village, and later gives her experiences in France in the last war, all leading up to the years she spent in London and South Africa, during which time she always advocated peace and progress for womankind. It seems ironic that one possessed with Winifred Holtby's undoubted talent for writing should die at the early age of thirty-seven. This book about her life is full of interesting extracts from her own writings—her books, her letters, her verses. This quotation, I think, conveys admirably the spirit of her writing:

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Well, bring out your paint pot, and hey presto! what a magic transformation!

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And finally, don't forget how important sleep is to one's complexion. Late nights very soon tell—rings and shadows form under your eyes, almost imperceptibly at first, but very surely, and once there they take a lot of removing. So avoid late nights, sleep with your window wide open, and start the next day with a fruit drink, and before very long you too will agree that even if it is only skin deep, beauty is a very valuable asset to the modern woman.

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but the chiffon square scarf, tied gipsy-wise around the head, is keeping in place the curls of the girls on every breezy day.

I saw and admired a most unusual frock in a shop window the other day. It was white georgette, the bodice tight-fitting and plainly cut, and the full skirt was embroidered with two

MY TREASURE.

Little wisp of straying hair
Gold across the white
Of the little cot where Babe is,
Tucked up for the night.
Droop the long dark lashes lower,
O'er the azure eyes . . .
Pearly ears they pay no heed to
My soft lullabies.
Flung outstretched the chubby arm
On the fleecy shawl,
Ten pink toes nestle closely
In a soft, warm ball.
Darling cherub, sent from heaven,
Sweetest dreams be thine.
God's own angels all will guard thee,
Sleep sweet, Baby-mine.

black cats, their tails up. Someone is going to look very coy when she dons this creation—lucky lass!

It's a grand feeling to be dressed again in the crisp linens and cool silks of summer days, and to know that the woollies we grew so tired of through the last months of winter are carefully tucked away with mothballs and tissue paper for a little while at least.

Waiting to be Won!

WHICH SHALL IT BE—FARM OR CITY?

ESPECIALLY now, in these days of wartime, the temptation is great to leave the farm and take up work in the city. There is so much the city has to offer a girl—bright lights, plenty of companionship, pleasant work in congenial surroundings—there are so many avenues opening for capable girls in shops and offices now that the boys are away. But, you say, these latter remarks apply more truly to the farm at present—here, too, the boys are away, and many a girl is helping as she never helped before in the effort to increase production. So—

"Should farm girls leave home now and take up work in the city"

It is a vital question—what do YOU think? Let me know your views before the 15th February, and don't worry if you feel you are not good at writing—it is originality of ideas that counts, not literary style.

Two prizes will be awarded: First 10/-, and second 5/-. Out with your pens and paper, and send your opinions to me:

"Mary"
C/o "Journal of Agriculture,"
P.O. Box 3004, Wellington.

¶ Closing date: 15th February, 1941

While the Log Burns . . .

A Book You Will Enjoy.

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Short Story

A DIRNDL FOR DIANA

"GO pleasantly peasant in a dirndl!"

The very words themselves seemed to step right out of the printed page as Diana looked at them. A dirndl! What fascinating frocks—just the very thing for her holiday. Tomorrow was payday—she would buy herself a dirndl for her holiday. Her holiday! Not very far away now, she thought excitedly—only ten days! Last year Aunt Susan had taken her to the country, but this year they were bound for Kowhai Bay, and what spot lovelier than Kowhai Bay with its dancing seas and golden sands?

Diana's fingers, as they tapped the keys of her typewriter next day, couldn't keep pace with her thoughts.

HOME.

All across the paling fence
Crimson ramblers grow;
In and out the ragged lawn
White-eyed daisies glow;
There's a dog beside the door,
Trusty, faithful, old . . .
And a mother waiting there,
With a heart of gold.
Were I to roam the wide world round
Joy enough 'twould be
Just to see the welcome that
My country home can be!

A dirndl—a dirndl for Diana! The words sang a song through her busy hours, but 5 o'clock came at last, and she was soon out in the streets, mingling with the crowds. She was terribly excited at the thought of buying a dirndl—last year she had worn slacks on her holiday, and, although Aunt Susan had not openly objected, Diana sensed that she had not approved. This year she would have a dirndl, and surely Aunt Susan would like her in the frock? So ran her happy thoughts as she pushed her way through the crowded street—a street so crowded indeed that Diana did not see the banana skin on the pavement, and, before she realised it, she was sprawling on the hard kerb.

Shaken and dizzy, she was helped to her feet by those around; shaken and dizzy she hardly saw the lad who found a taxi for her, and sent her home in it. But the lad carried away with him the impression of a girl in her early twenties, fair haired, brown eyed.

The fall did not upset Diana seriously. She was tucked into bed when she arrived home, and a sound night's sleep did wonders for her. But the next morning she made a discovery. There was a parcel in her small handbag, a parcel that surely had not been there when she had left the office the night before. With wondering fingers she unwrapped it, and found inside a dirndl! It was the very gayest gipsy-striped dirndl, in all the brightest colours of the peasanty frocks. She had been so dazed the night before she had not realised, until now, that she had not bought her dirndl, and yet, here, like a gift from the gods it seemed, here was surely the very prettiest of them all!

Diana ran her mind quickly over the events of the previous night—the hurry from the office, the fall in the street, the lad helping her into a taxi. Why, of course, he must have dropped it into her bag accidentally as he helped her up. There was only one thing to do—she had better advertise And advertise she did. But the lad who had helped her either did not see the advertisement or did not want the parcel.

* * *

Kowhai Bay! Aunt Susan and Diana arrived at the end of a tiring day's travel, and welcomed the cool of the sea breeze that blew in the open window. Downstairs there was dancing on the wide verandah, and the music floated up on the still air.

Diana and Aunt Susan set off for the beach early the next day, Diana clad in her dirndl. She was a little dubious about wearing the frock, but after all, she **had** advertised, and there was little use in buying another dirndl, and leaving this one at home.

Down at the beach she undressed in the bathing shed, and then a swim. Oh, the thrill of that first dip! And afterwards, a lazy sunbathe, with Aunt Susan sitting beside her. There were people all around—jolly, laughing groups of boys and girls. Diana wished a little longingly that she was one of the merry group near her instead of lying in the sand with Aunt Susan. But no—she must not think that!

Two days passed. And on the third day Aunt Susan had a headache. All the morning Diana sat with her, smoothing the tired brow with cool hands, talking softly with gentle voice. But the afternoon found her sunbathing alone on the hot sands.

People all around—yet no one looked familiar. Laughing people, happy people, and no one she knew. But who was this coming towards her—there was something she seemed to recognise in the boy who said to her: "Why—excuse me—but aren't you the little lady who fell down in the street? Were you hurt?"

Realisation flashed through Diana's mind—the owner of the dirndl!

"I'm—I'm all right, thank you," she replied, agitatedly. "It was only a slight fall. But thank you for helping me that night—it was good of you."

Here is a striking dress in brown and white spot fine wool with a full skirt.

She wished he hadn't sat down beside her—whatever was she going to do? For his dirndl was in the bathing shed, and now he would surely see her in it. She decided it was all up, but in the meantime she was going to wait till he mentioned the frock.

Quite naturally it seemed, he lay on the sand beside her, and she learned he had only arrived that morning. The afternoon slipped away in idle conversation. Still the lad, whose name was Denis, talked to Diana on the beach. She wished desperately that

he would go—Aunt Susan would be wondering whatever had happened to her. But she couldn't go to the bathing shed and then come back dressed in his frock!

It grew cooler. Diana stirred herself, and shivered a little. Well, if he would not go, she would have to face up to it.

"Think it's about time I went and dressed," she said, trying to be casual.

"What about coming dancing tonight?" asked Denis. "I see there is one on in the Kiosk. It would be fun," he added.

"It would be fun," repeated Diana slowly. "But I'm not sure—I must see my aunt first. Could we go perhaps—tomorrow night instead?" Yet it was hard to hide the disappointment in her eyes, impossible to keep the catch out of her voice.

"We could, but I'll ring you later, and see if we can go tonight. Where are you staying?"

"At the Gables," was the reply.

The boy laughed happily.

"Why, that's where I am too. I'll see you later. Don't forget though—the dance is tonight!"

"No, I won't forget," Diana called back, as she went to the bathing shed. The dance was tonight, he had said, but how could she go to the dance when she had his frock? Thank goodness, she wouldn't have to wear the dirndl to the dance, anyway.

Dressed in her dirndl, she left the bathing shed, glancing round cautiously. Glad relief—Denis had disappeared! She would get back to the Gables without him seeing her, and then she would put the frock away for the rest of the holiday.

In the open door, and up the stairs she ran. Breathless, she arrived at the top, and came face to face with Denis! Well, it was all up now. Bewildered, she looked up at him, expecting to see the surprised look of hurt in his eyes.

"Why, you're wearing it, and how well it suits you! It couldn't have been better had I known you before that night I slipped it into——"

"You—you slipped it into my bag?"

"Yes—on purpose."

"But I advertised, and—"

"Still coming to the dance tonight?" interrupted Denis.

"That depends on Aunt Susan."

"Well, if you come tonight, I'll tell you how I came to leave the dirndl in your bag," promised Denis.

There was dancing that night for Diana, dancing to dreamy tunes, with Denis's arm around her white slimness. Surely no prettier girl anywhere tonight than this Diana, so bright her expression, so shining her eyes, so sweet in her frock of white organdie.

"It is hot," sighed Diana, as they swung round in a military two-step.

"Outside it is cool—outside I could tell you the story of the dirndl. Shall we go?"

Diana nodded, and Denis led her from the hot room to where the waves lapped softly against the sleeping sands, still and peaceful in the moonlight. One arm went round Diana's slimness as they walked by the sea.

"It's like this," began the boy. "My sister saw an ad. in the paper the night before I saw you. It said: 'Go pleasantly peasant in a dirndl.' And I knew she wanted one for her holiday. So—manlike—I strode into the shop the next morning, and chose the prettiest one for her. But at lunchtime I found that she, too, had had the same bright idea. I couldn't very well tell her that I had bought one for her, and I couldn't give her my dirndl when she already had one, could I?"

"Duffer!" laughed Diana. "Of course you could have changed it for something else."

"Perhaps so—but I hate making a fuss. So, I set out to lose it. It was like a heaven-sent miracle when you slipped at my feet—you, Diana, with your brown eyes and fair hair, just made for a golden dirndl. Of course it was an easy matter to slip it into your bag, you were so dazed at the time."

"And I advertised—I thought you had lost it accidentally."

"Yes, I saw your ad., and I wanted to answer it, too, just to see whether my picture of you and the frock came up to expectations. But I didn't dream I would find you here, today."

"You've no idea how terrible I felt this afternoon, when I found it was your dirndl. But I had to wear it home—I had nothing else, and I do hope you don't mind."

"Mind? Why, Diana!" The arm around her tightened, and he was facing her. "Once it was a dirndl for Diana," he said, very softly. "Do you think . . . someday . . . there might be a wedding dress for Diana, too?"

And he found his answer in the shining eyes that smiled up at him.

YOU WON'T HAVE RHEUMATISM

Rheumatism is due to a blood condition. If you have a tendency to acidity you are liable to it. There is a simple prescription for this. Acids accumulate in the blood when the liver is lazy and the kidneys sluggish. To tonic the liver and make the kidneys active there is nothing better than Kruschen Salts. As the analysis on the bottle shows, this is not a patent medicine or a secret remedy. It is a combination of six natural salts. Doctors have been familiar for years with the action of these salts, have been prescribing them for years. They stimulate the liver and kidneys. Acid in the blood is dissolved, washed out. A pinch of Kruschen every morning in hot water or tea is a preventive. Sufficient to keep many people free from rheumatism. A half or full teaspoonful is advised in obstinate cases.

YOU'LL FEEL ALL THE BETTER FOR A PINCH OF

KRUSCHEN

Take Kruschen in tea or hot water. 2/5 a bottle at Chemists and Stores.

K4-

Helpful Hannah Says . . .

If you catch your silk stockings, pull the thread to the inside and apply a little colourless liquid nail polish. This will prevent laddering.

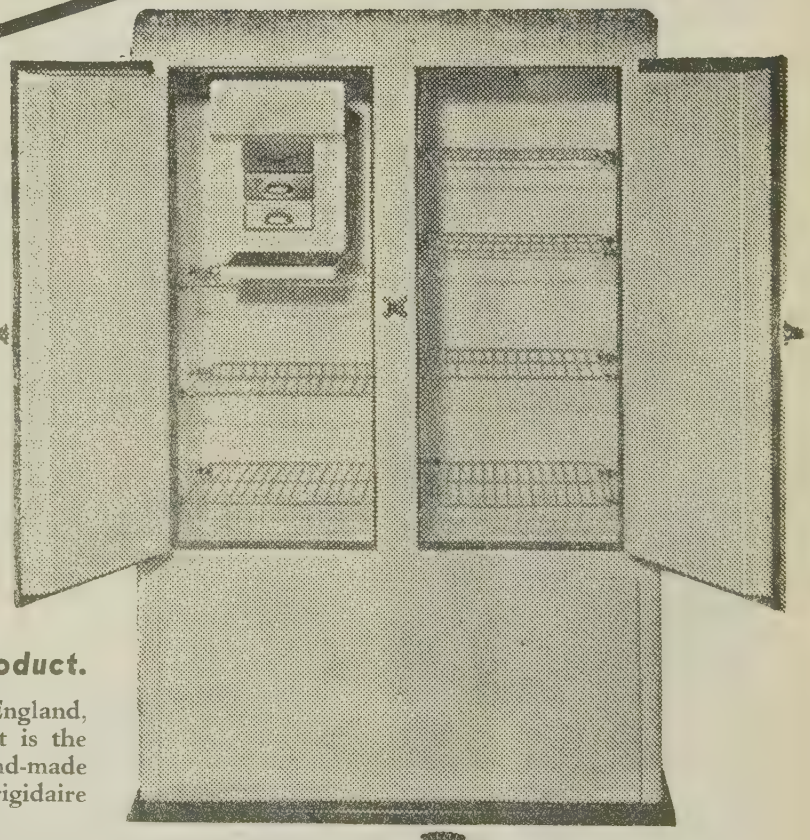
* * *

Liquid nail polish is also invaluable for mending glass, especially crystal. Apply the liquid to the clean edge, press closely together quickly, and the break will be almost invisible.

* * *

You will find that the handles on the lids of your aluminium pots sometimes are too hot to hold. Try slipping a cork lengthwise under the handle—saves burnt fingers.

it pays Farmers to insist on a GENUINE FRIGIDAIRE



When you choose the refrigerator you'll eventually buy, make sure that full service facilities are available to you. Only Frigidaire gives complete Dominion-wide service, no matter where you live, or where you purchased your Frigidaire. It pays you to insist on a genuine Frigidaire for other reasons, too. For quality — demonstrated by Frigidaire's method of completely sealing all insulation; for convenience features; and for *permanent* economy. This Frigidaire is built specially for farmers. Send the coupon below for full particulars.

Frigidaire is an EMPIRE Product.

Frigidaire's compressor unit is made in England, and its Delco Motor in Canada. And it is the only refrigerator with a New Zealand-made cabinet of welded all-steel construction. Frigidaire is British — through and through.

FREE

FRIGIDAIRE NEW ZEALAND,
PETONE.

Dear Sirs,—I am interested in your Frigidaire which is specially built for the farmer. Will you please send me, without obligation, full details and illustrated literature by return mail.

Name .....

Address .....

.....

FRIGIDAIRE

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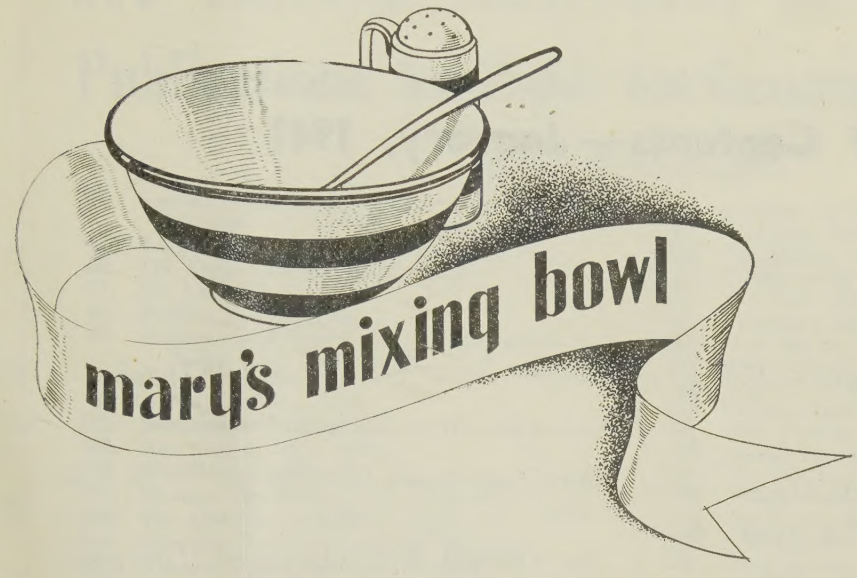
FRIGIDAIRE NEW ZEALAND (Division of General Motors New Zealand Limited, Petone).

Only Frigidaire Gives SERVICE EVERYWHERE *in New Zealand,*

no matter how remote, or where the Frigidaire was originally purchased.

BE MODERN • BE THRIFTY • INSTALL A GENUINE FRIGIDAIRE THIS YEAR!



TOMATO FRITTERS.

To make the batter, sift 4oz. of flour into a bowl, add a pinch of salt, and a tablespoon of salad oil. Gradually add a quarter of a pint of lukewarm water, beating all the time. If time permits, leave the batter in a cool place for a short while, and just before using it, fold in the white of an egg, beaten stiffly. Choose firm, small tomatoes, skin and quarter as many as you need, put them into a dish, and season well with salt, pepper, vinegar and chopped parsley, leaving them for a while. Now drop the tomatoes into the batter, and then into boiling deep fat. Fry for a few minutes, until golden brown, drain well, and serve immediately. You will enjoy these — they are delicious.

* * *

TOASTED HAM.

1¾ teaspoons flour, ½ oz. of butter, 1 gill of milk, seasoning, 5oz. cooked ham.

Melt the butter in frying pan, add flour, when blended stir in milk, and bring to boil. Boil gently for a few minutes, add seasoning, then the cooked ham. Now place on buttered toast and add the parsley. For a tasty tea this is unbeatable.

* * *

BAKED CHEESE SOUFFLE.

1oz. flour, ½oz. butter, 1 gill of milk, pinch of salt, 3oz. of grated cheese, 1 teaspoon mustard, 2 eggs.

Mix the flour and butter in saucepan, pour in the milk, simmer five minutes, cool, then mix in salt, pepper, mustard, beaten egg yolks, and half the grated cheese. Mix well, stir in lightly beaten egg whites, put in pie-dish, with grated cheese on top. Bake slowly for 30 minutes.

BAKED APPLE CHARLOTTE.

6 apples, ½lb. breadcrumbs, 2oz. suet, 2oz. sugar.

Peel, core and slice the apples. Mix the breadcrumbs, shredded suet and sugar together. Place alternate layers of prepared apples and breadcrumb mixture in a greased piedish, finishing with breadcrumbs. A little water may be added to the apples if necessary.

Your Favourite Mushroom Recipe

It may seem early, in mid-summer, to turn your thoughts to mushrooms, but it won't really be very long now before you are out gathering them in the dawn-light, and taking them home for a tasty breakfast.

Send your favourite mushroom recipe to the "Mixing Bowl."

A cash prize of 2/6 will be awarded for the best recipe received by 15th February, 1941.

Bake in a moderate oven for about 1½ hours until the apples are cooked, and the pudding nicely browned.

* * *

CHOCOLATE SAGO.

2 breakfast cups of milk and water, 2 level teaspoons cocoa, 4 level teaspoons sugar, 4 level tablespoons sago, 1 egg.

Mix the sugar, cocoa and salt to a smooth paste with a little cold milk, add the remaining liquid, and stir over fire until boiling. Remove from fire, and stir in well-washed sago, then cook slowly, stirring well, until the sago is clear. Now take off the fire again, and stir in the well-beaten egg. Cook slightly, but do not boil.

* * *

RAISIN GINGERBREAD.

½ cup melted butter, 1 cup brown sugar, 2 cups flour, 1 teaspoonful each of bicarbonate of soda, mixed spice, and ground ginger, 2 teaspoons cinnamon, 2 tablespoons treacle, ¾ cup raisins, 1 egg, ½ cup milk.

Sift flour and pinch of salt, soda and spices together in basin, and add sugar and raisins. Make a hole in the centre and pour in melted butter. Then add well beaten egg, treacle slightly warmed, and milk. Mix together lightly, and turn into shallow tin lined with greaseproof paper. Bake 45 minutes in moderate oven.

* * *

CANADIAN DATE CAKE.

2 eggs, ½lb. butter, 1 cup sugar, 2 cups flour, 1 teaspoonful soda, ¾ cup of cold water, 1 cupful dates, 1 cupful walnuts.

Cream the butter and sugar, add eggs well beaten, then dates, and soda dissolved in the water. When you start to mix the cake pour water over dates, with soda dissolved in it. Bake in a moderate oven.

* * *

CHOCOLATE CAKE.

¼lb. butter, ¼lb. sugar, 2 eggs, 1½ pieces cooking chocolate, 2 tablespoons boiling water, 1 small teaspoonful baking powder, 2½oz. flour.

Cream the butter and sugar. Add eggs, well beaten, then the chocolate dissolved in boiling water, and lastly sifted flour and baking powder. Bake in sandwich tin, and ice.

* * *

RHUBARB CHUTNEY.

2lb. rhubarb, 1lb. sultanas, 2lb. sugar, 1oz. garlic (cut finely), 1½oz. salt, 1oz. bruised ginger, 1 pint vinegar, 2 lemons (cut finely).

Cut rhubarb into small pieces, remove the rind from the lemons, and take out the pulp and cut up. Cut the garlic very fine, put ginger in muslin bag. Put all into preserving pan and boil 1½ hours, remove the ginger, put in jars, and seal when cold.

* * *

BEETROOT CHUTNEY.

3lb. beetroot, 1 pint vinegar, 1½lb. apples, ½ teaspoon ginger, 2 Spanish onions, 1 teaspoon salt, juice of good-sized lemon, ½lb. sugar.

Cook and peel beetroot, then cut into small cubes. Chop apples, and boil in the vinegar to which other ingredients have been added. Boil for 20 minutes, then add the beetroot cubes. Boil for 15 minutes. Bottle when cool. Can be used in one week.

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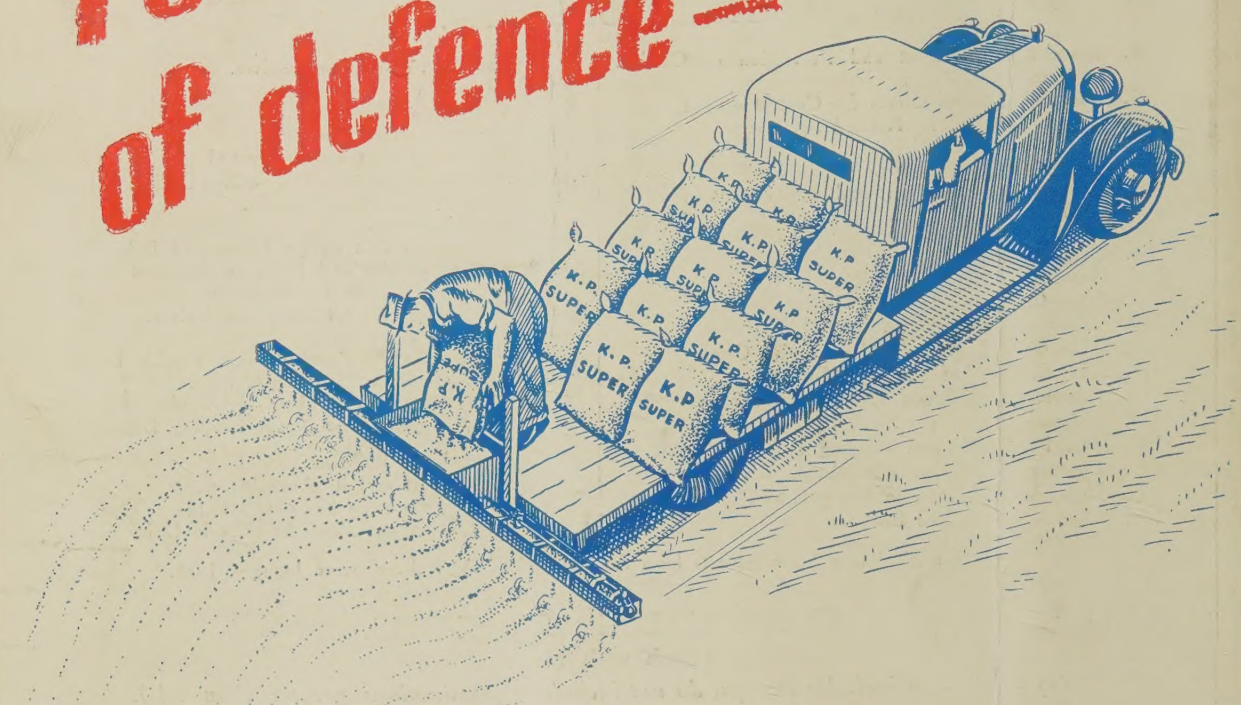

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